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AT

HARVARD COLLEGE.

VOL. XXIV.

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Memoirs of the Museum of Comparative Zoölogy

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VOL. XXIV.

REPORTS ON AN EXPLORATION OFF THE WEST COASTS OF MEXICO, CENTRAL AND SOUTH AMERICA, AND OFF THE GALAPAGOS ISLANDS, IN CHARGE OF ALEXANDER AGASSIZ, BY THE U. S. FISH COMMISSION STEAMER "ALBATROSS," DURING 1891, LIEUT. COMMANDER Z. L. TANNER, U. S. N., COMMANDING.

XXVI.

THE FISHES.

BY S. GARMAN.

ONE VOLUME TEXT,

WITH NINETY-SEVEN PLATES,

AND A CHART OF THE ROUTE.

PLATES.

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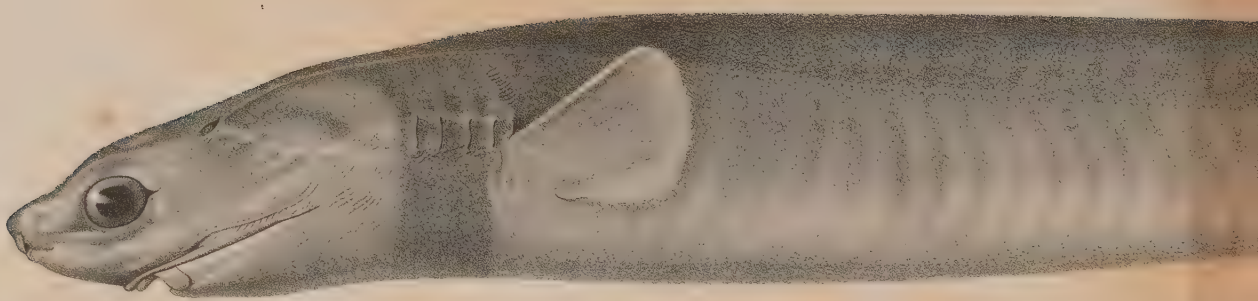
DECEMBER, 1899.

PLATE I.

Fig. 1. Isistius brasiliensis Q. G. Page 34.

Fig. 2. Centroscyllium nigrum Garm. Page 28.

ALBATROSS EX. 1891.



A.M.Westergren del.

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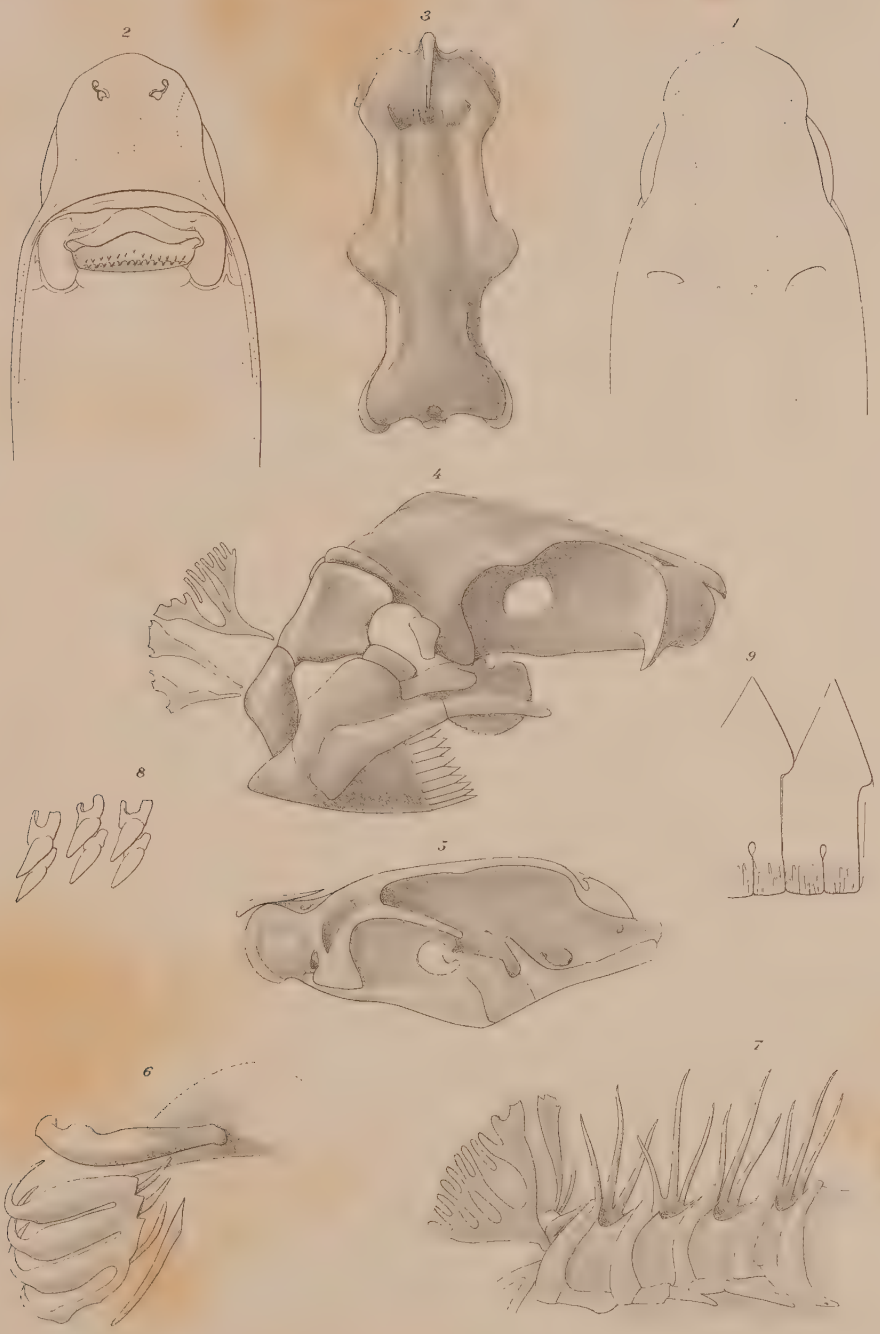

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PLATE III.

ISISTIUS BRASILIENSIS Q. G. Page 34.

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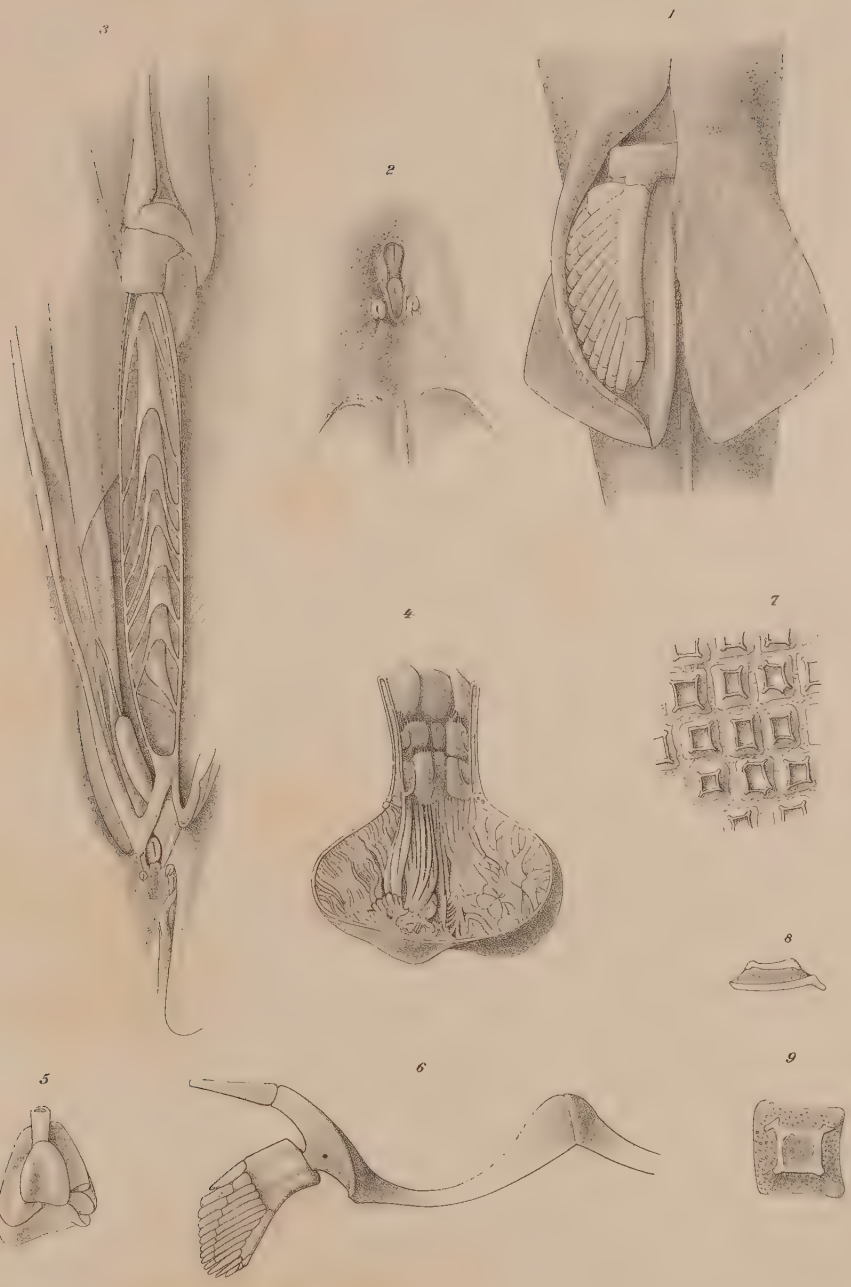

A.M.Westergren del. B.Meisel lith.

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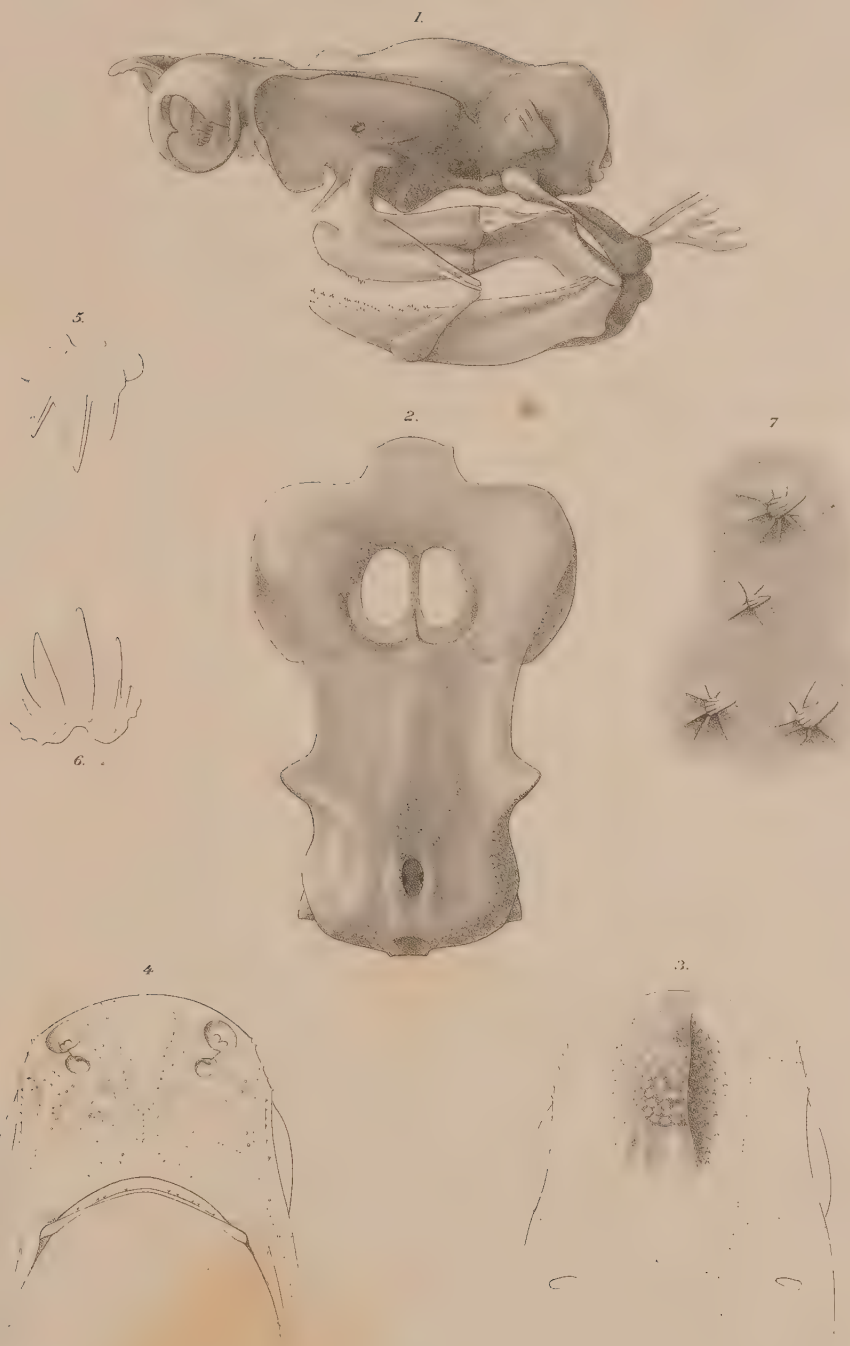

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A.M.Westergren del. B.Meisel lith.

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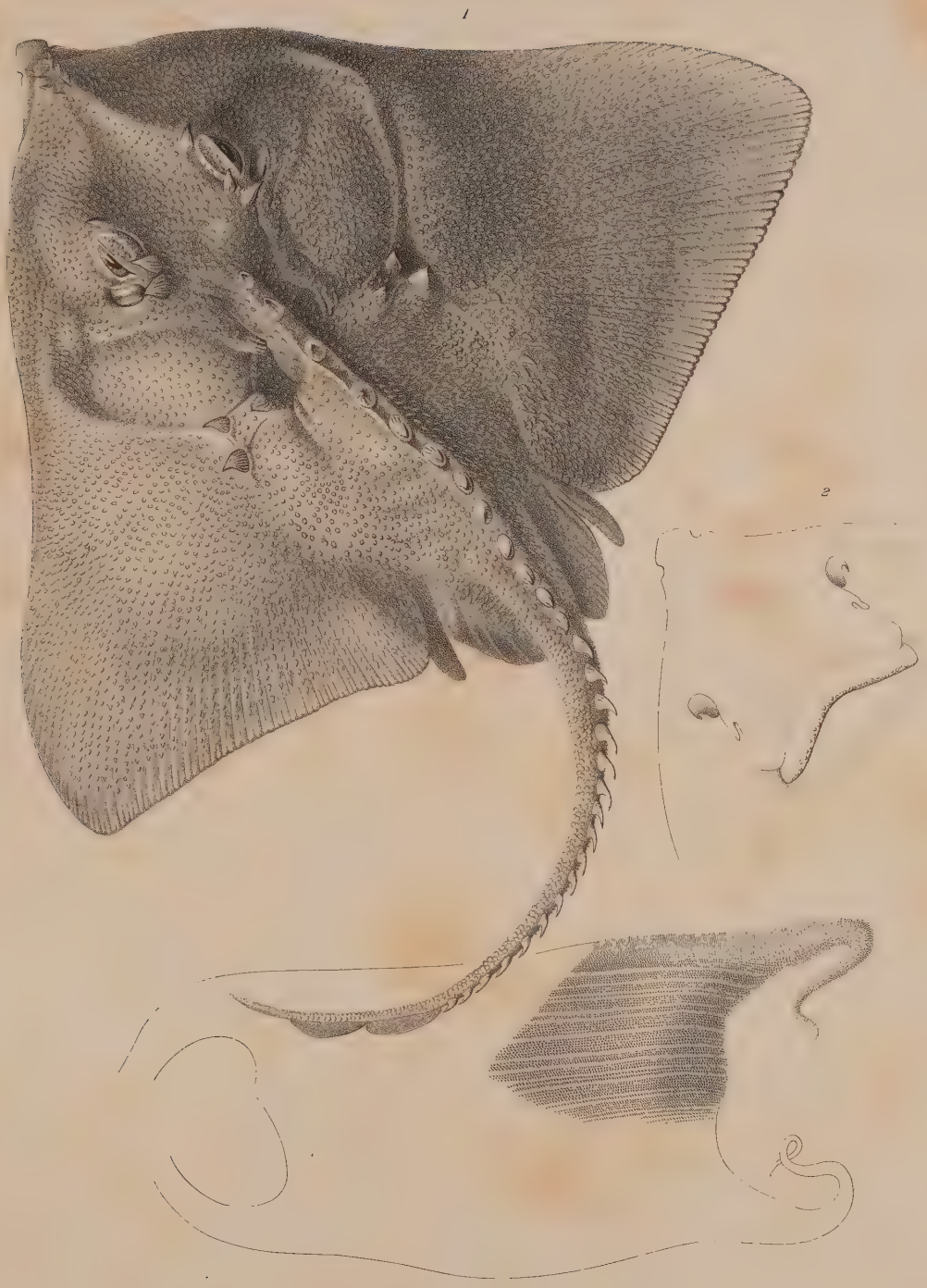

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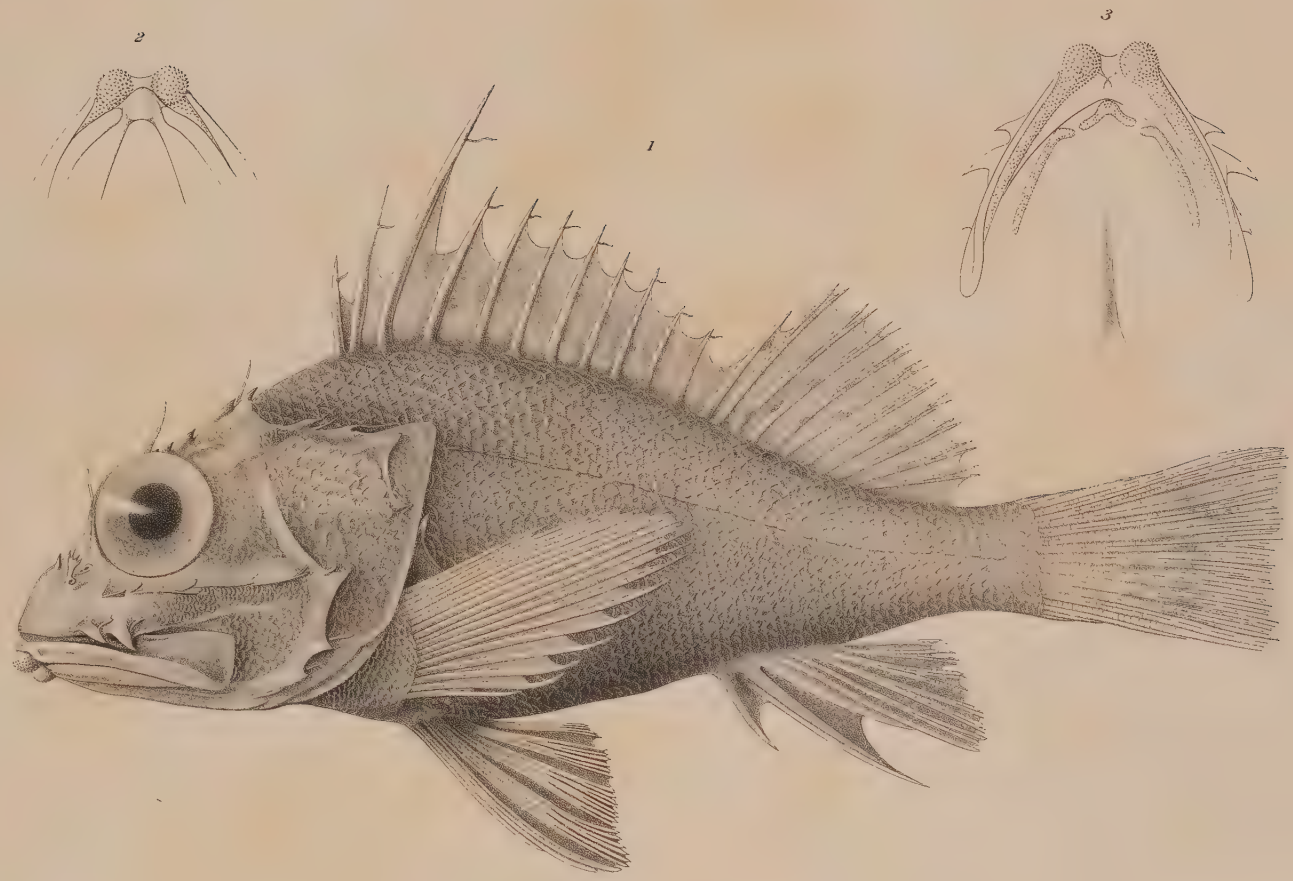

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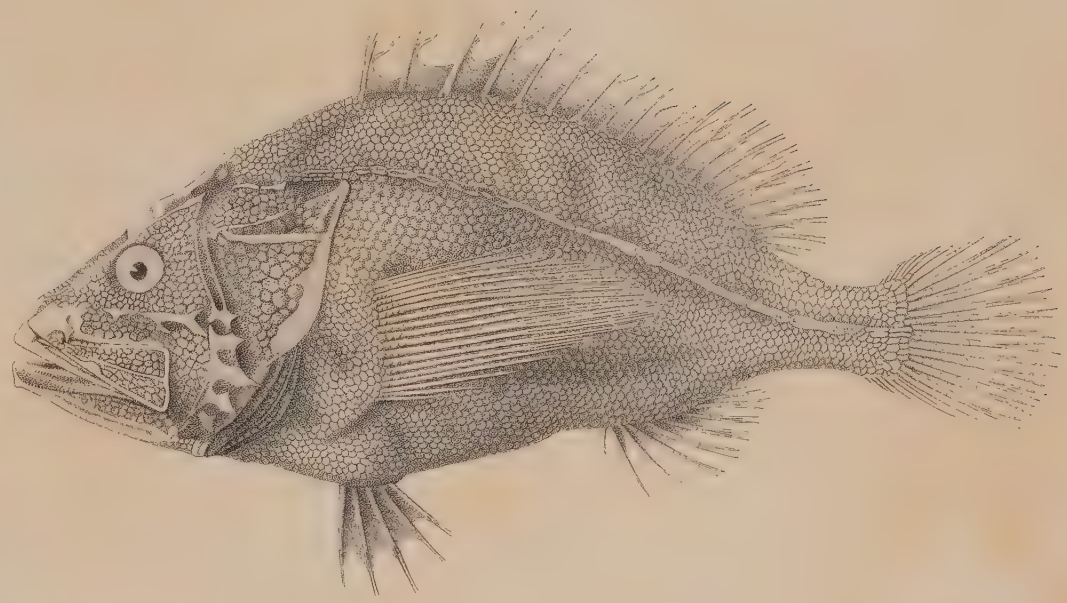
B.Meisel.lith.

PLATE VIII.

ECTREPOSEBASTES IMUS Garm. Page 53.



A.M Westergren del.

B Meisel. lith.

PLATE IX.

ECTREPOSEBASTES IMUS Garm. Page 53.

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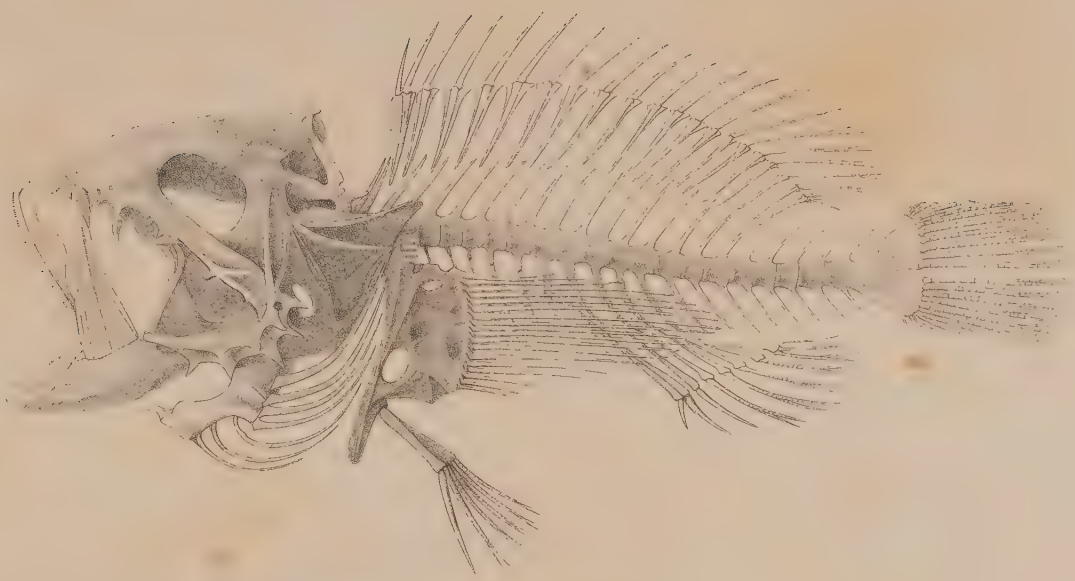
1.



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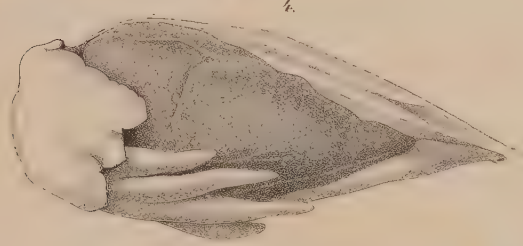

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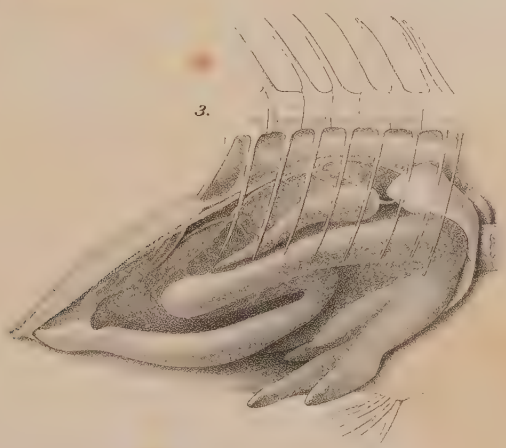

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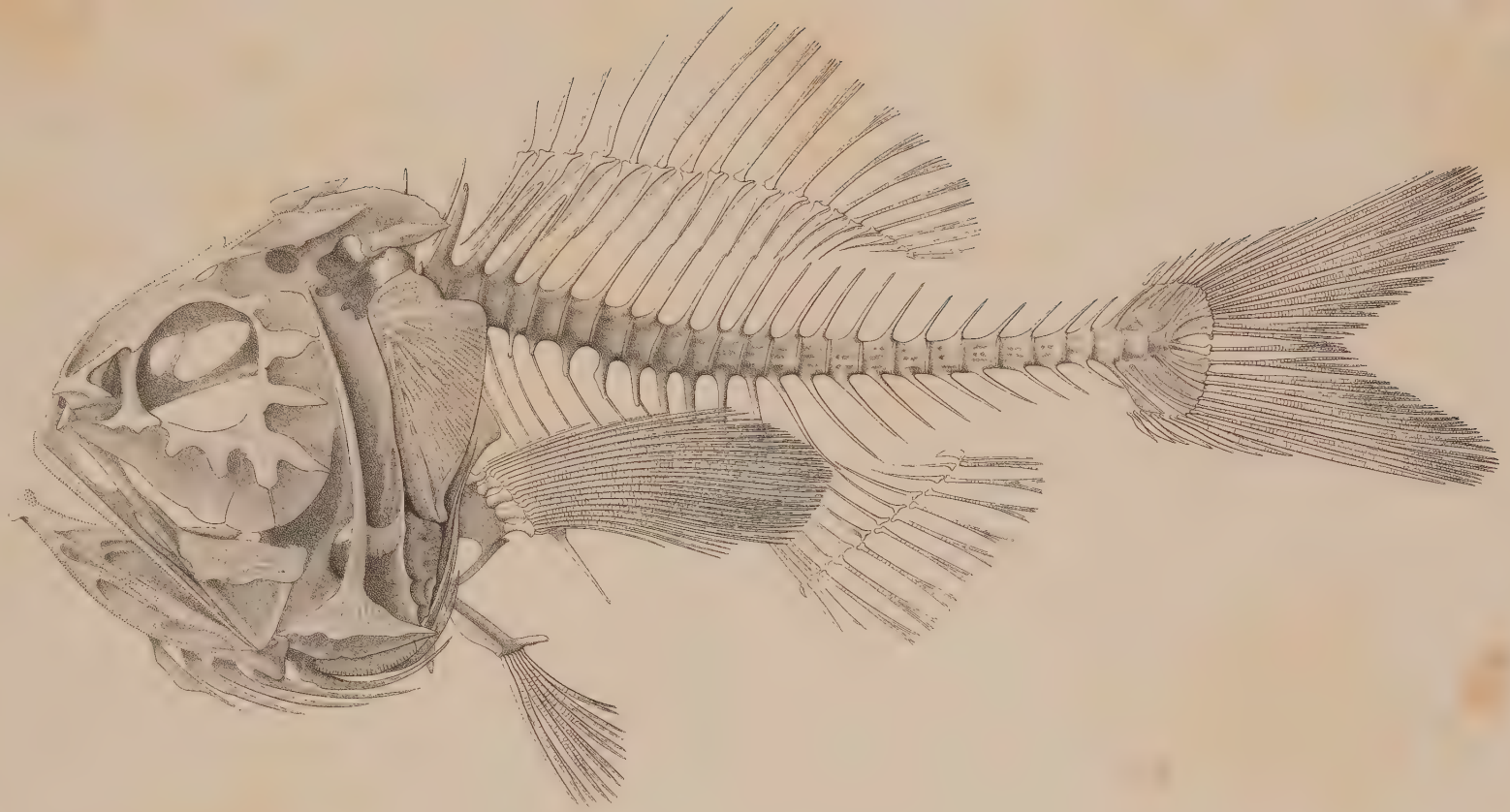
PLATE X.

HOPLOSTETHUS PACIFICUS Garm. Page 56.



A.M.Westergren del.

B.Meisel, lith.

PLATE XI.

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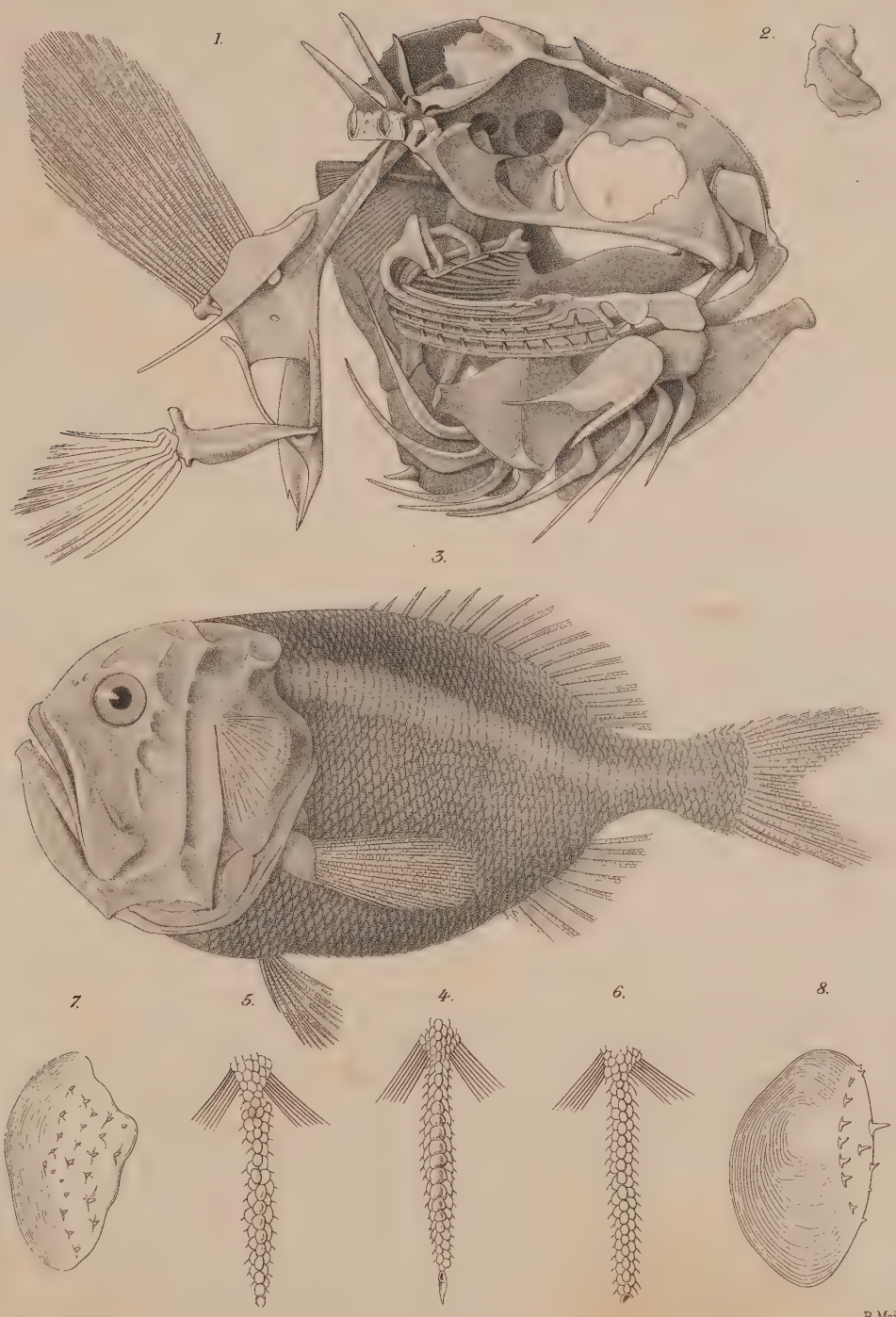

A.M. Westergren del.

B. Meisel, lith.

PLATE XII.

CAULOLEPIS SUBULIDENS Garm. Page 60.

Fig. 1. Skeleton and viscera, from the right side.

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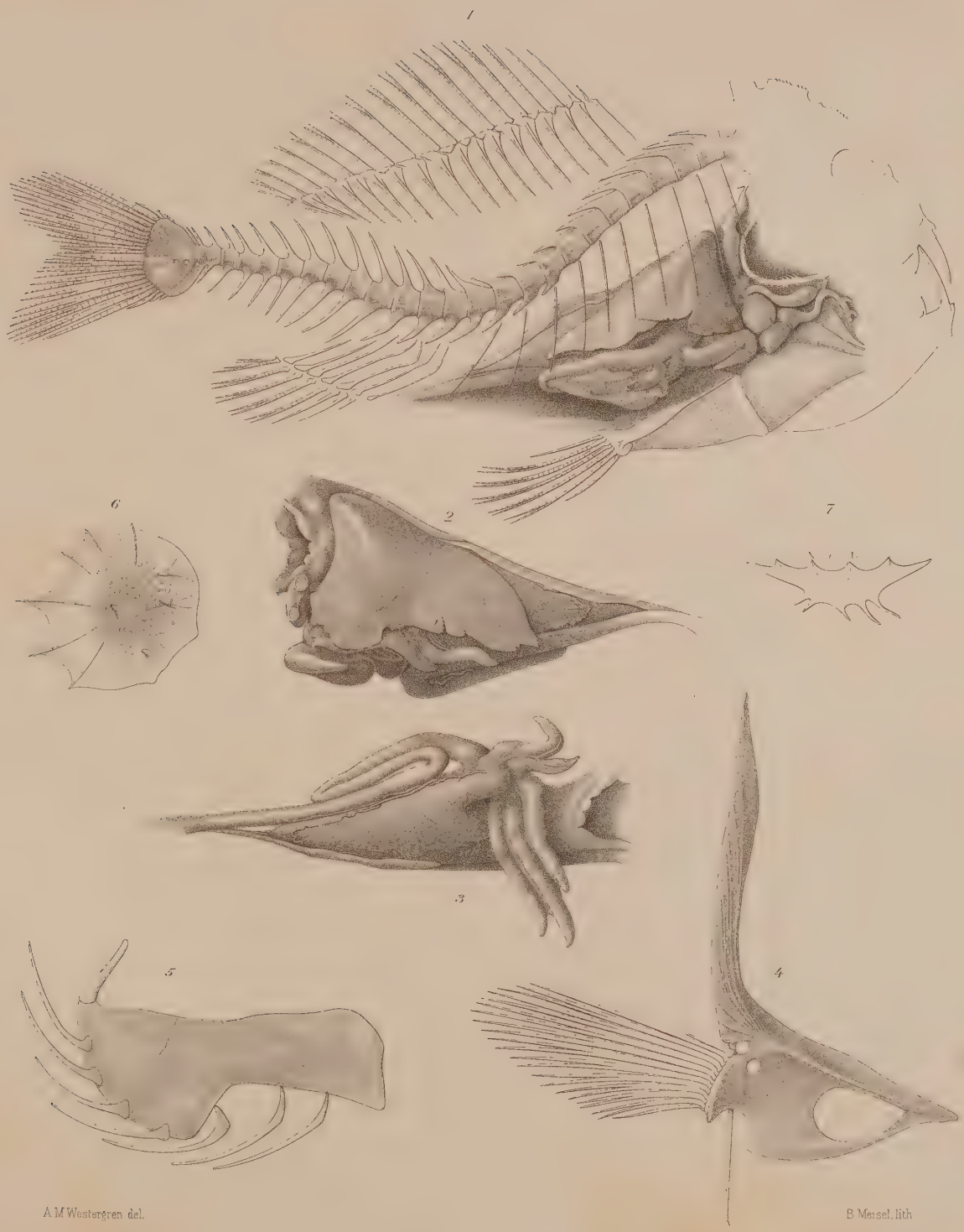

A.M.Westergren del. B.Meisel, lith.

PLATE XIII.

DOLOPICHTHYS ALLECTOR Garm. Page 81.

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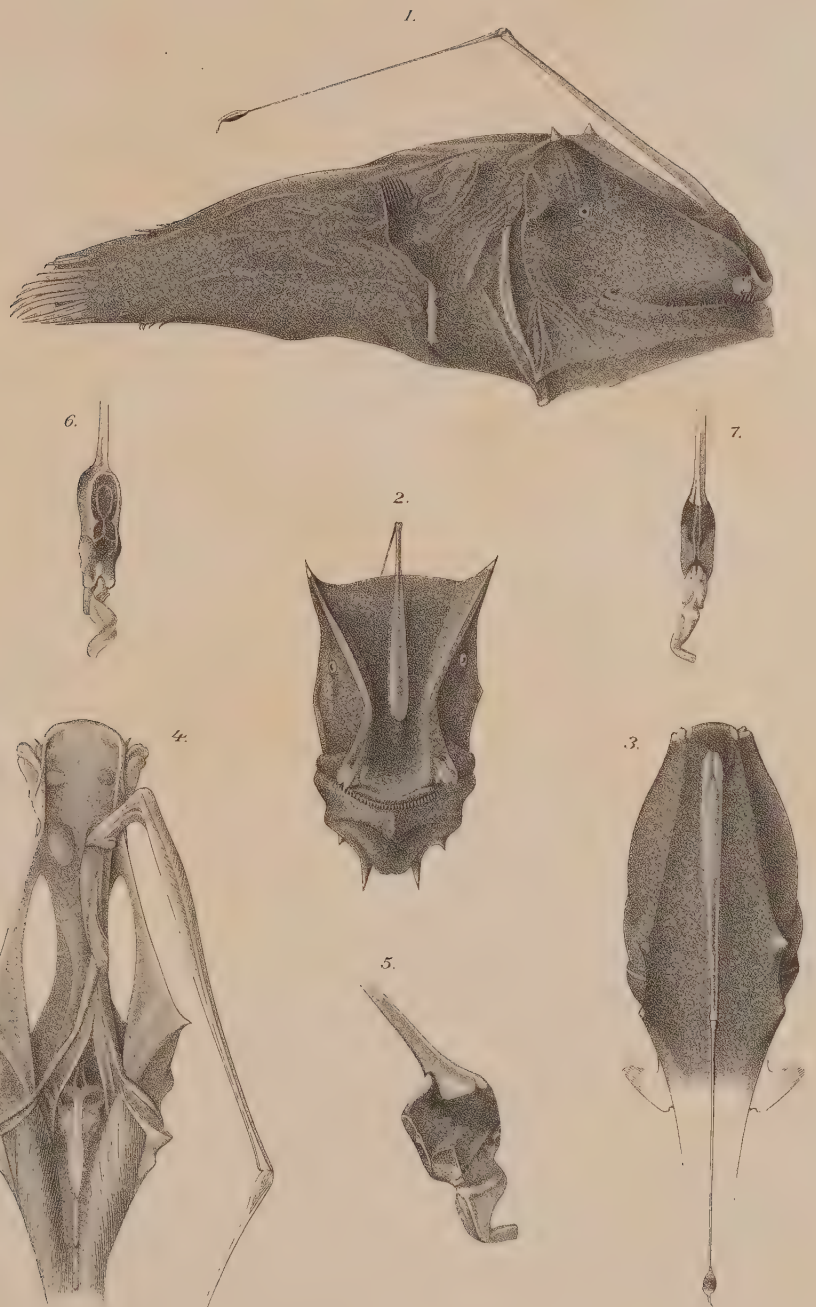

A.M. Westergren del.

B. Meisel. lith.

PLATE XIV.

DOLOPICHTHYS ALLECTOR Garm. Page 81.

Fig. 1. Muscles and bones of the left side after removal of the skin.

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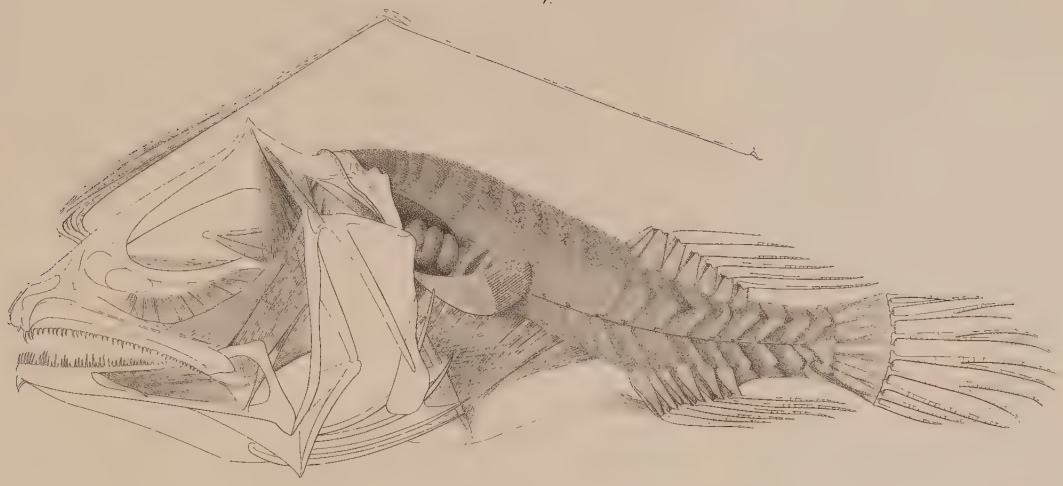
1.



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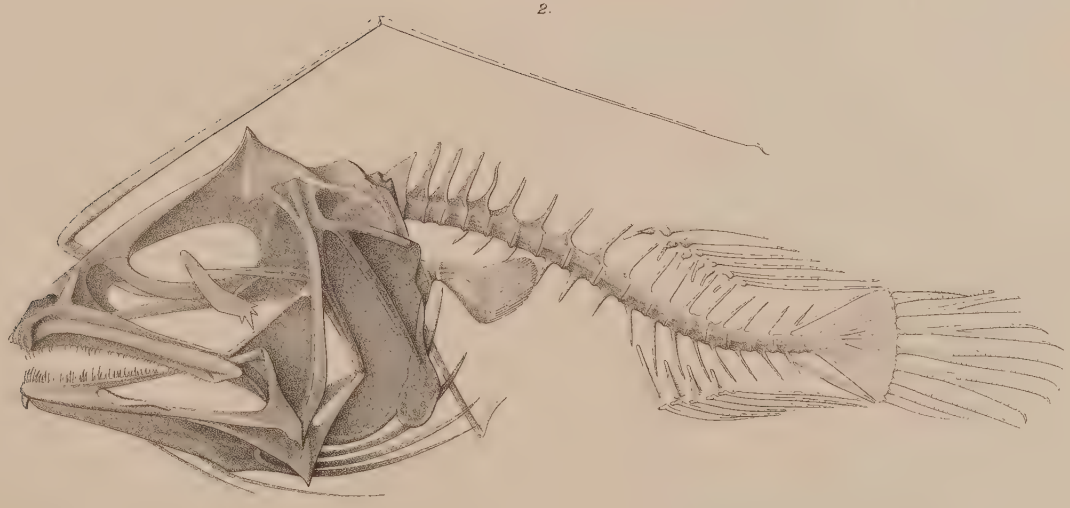

A.M. Westergren del. B. Meisel, lith.

PLATE XV.

DOLOPICHTHYS ALLECTOR Garm. Page 81.

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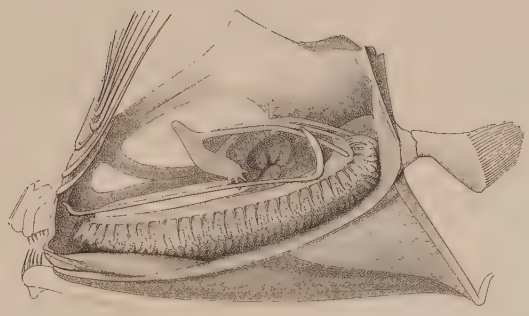
Fig. 5. Viscera in place, as seen from the left side.



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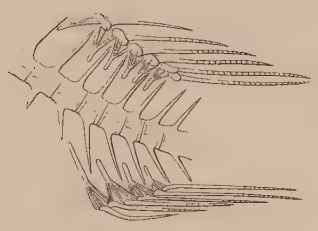

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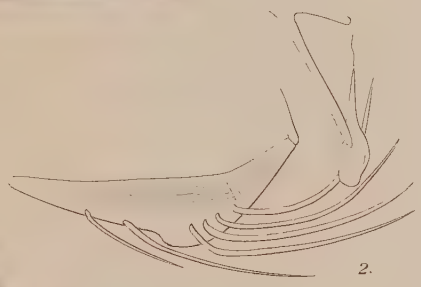

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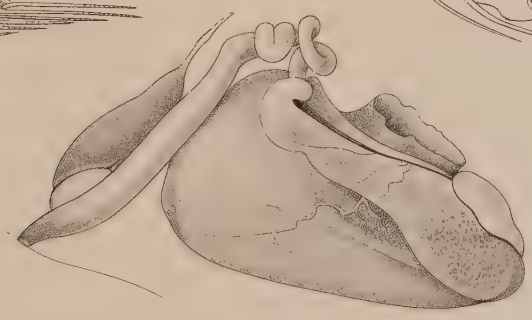

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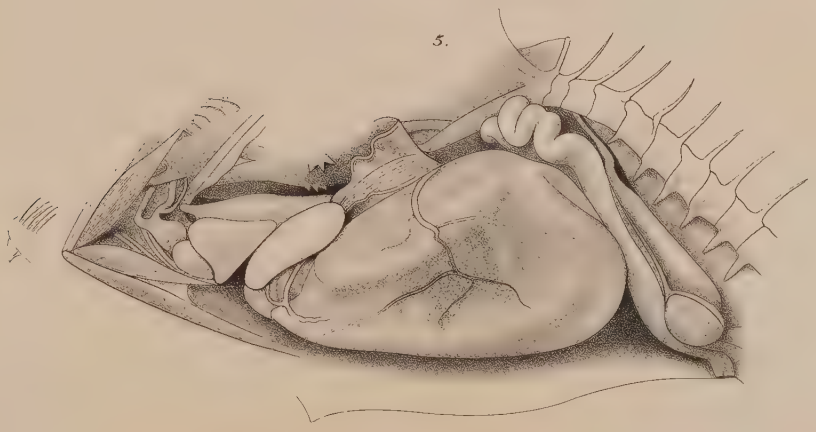

PLATE XVI.

CHAUNAX COLORATUS Garm. Page 83.

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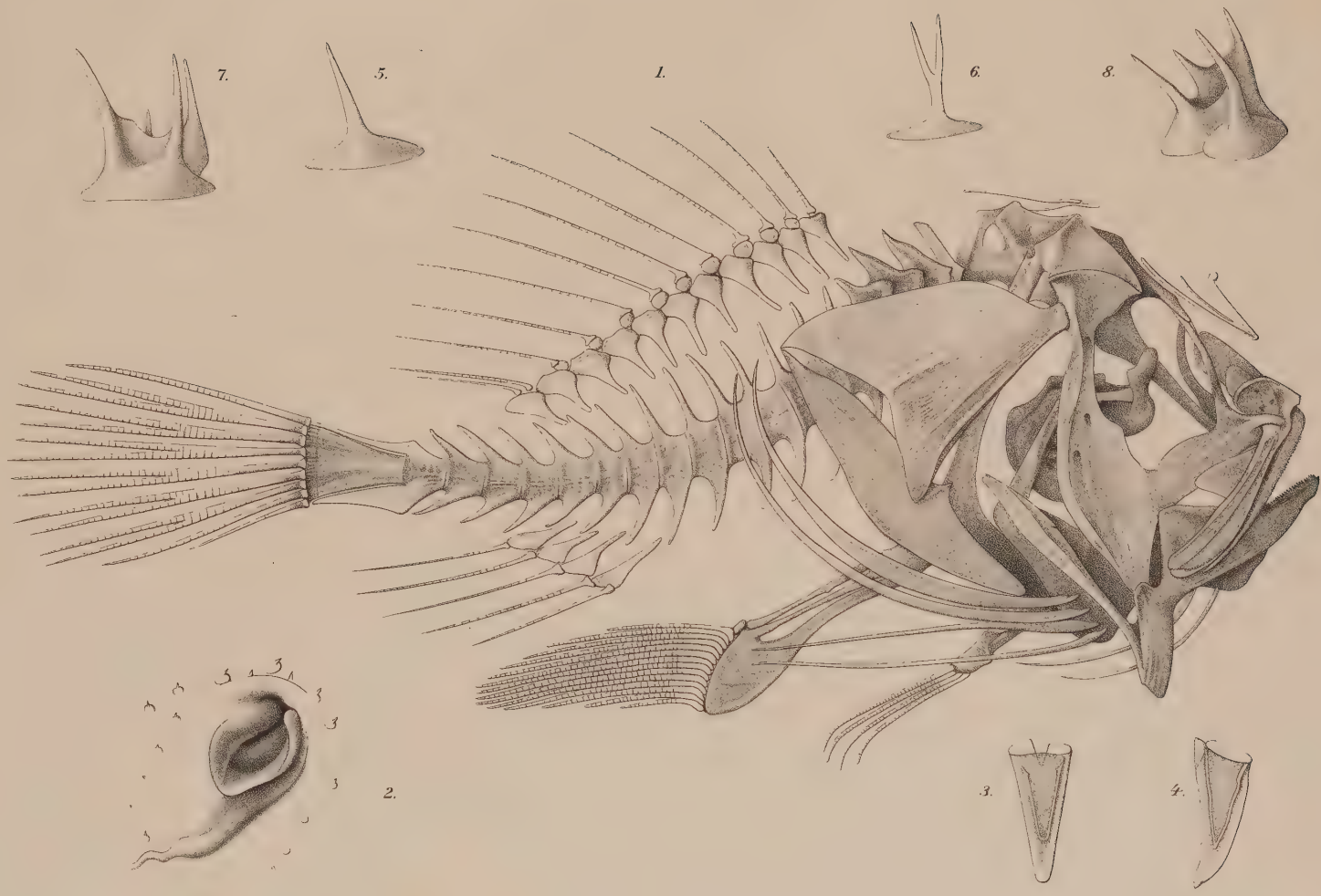

A.M. Westergren del. B. Meisel. lith.

PLATE XVII.

CHAUNAX COLORATUS Garm. Page 83.

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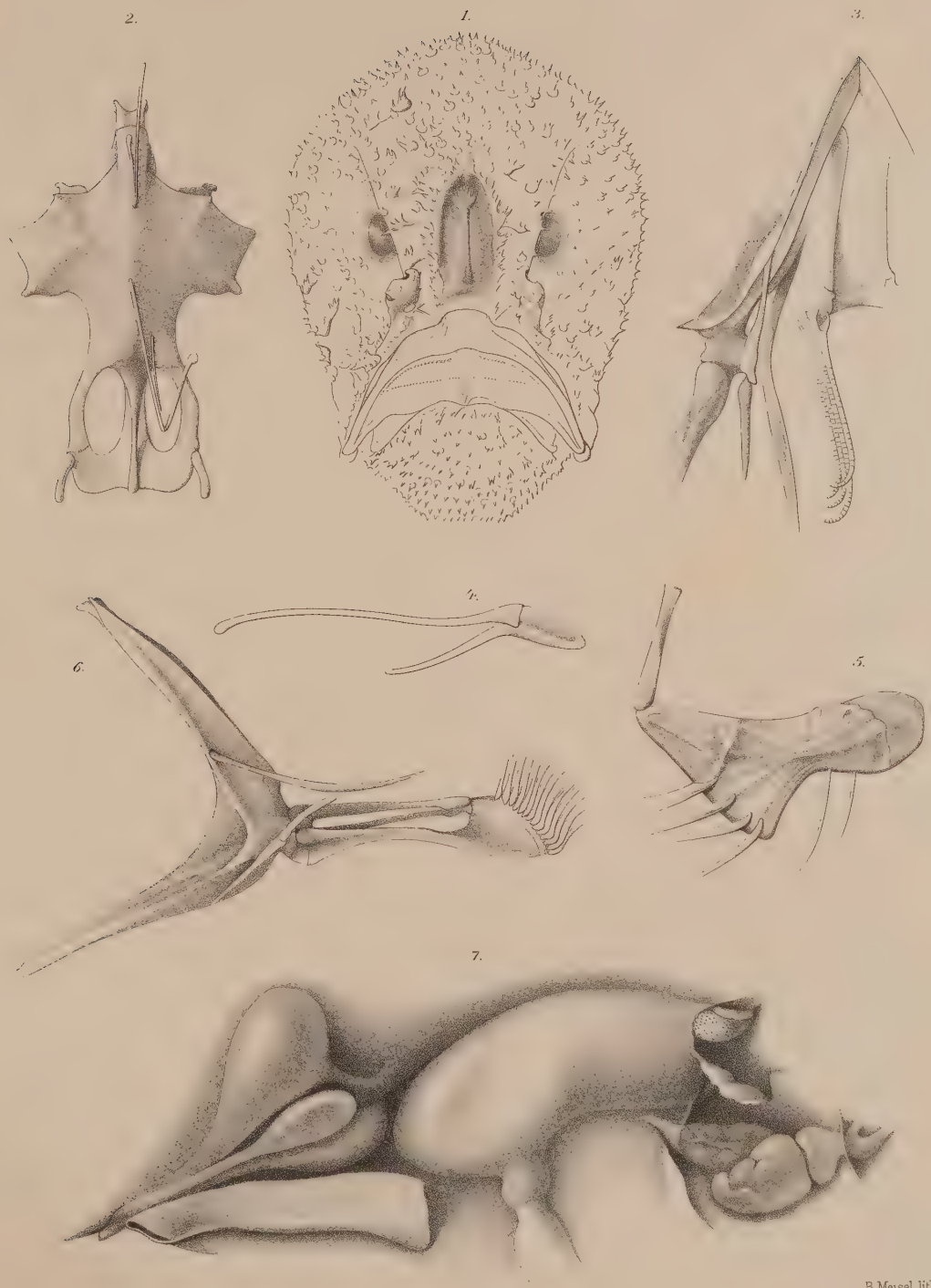
Fig. 5. Hyal bones and branchiostegal rays.

Fig. 6. Scapulary arch and bones of the pectoral fin.

Fig. 7. Viscera, shown from the right side.



A.M. Westergren del.

B. Meisel, lith.

PLATE XVIII.

MALTHOPSIS SPARSA Garm. Page 101.

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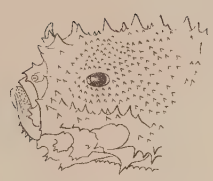
3.



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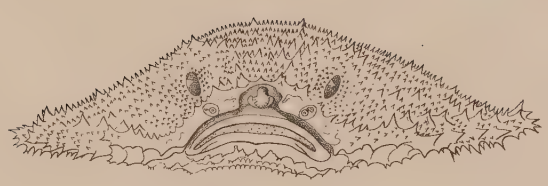

A.M. Westergren del.

B. Mersol, lith.

PLATE XIX.

MALTHOPSIS ERINACEA Garm. Page 103.

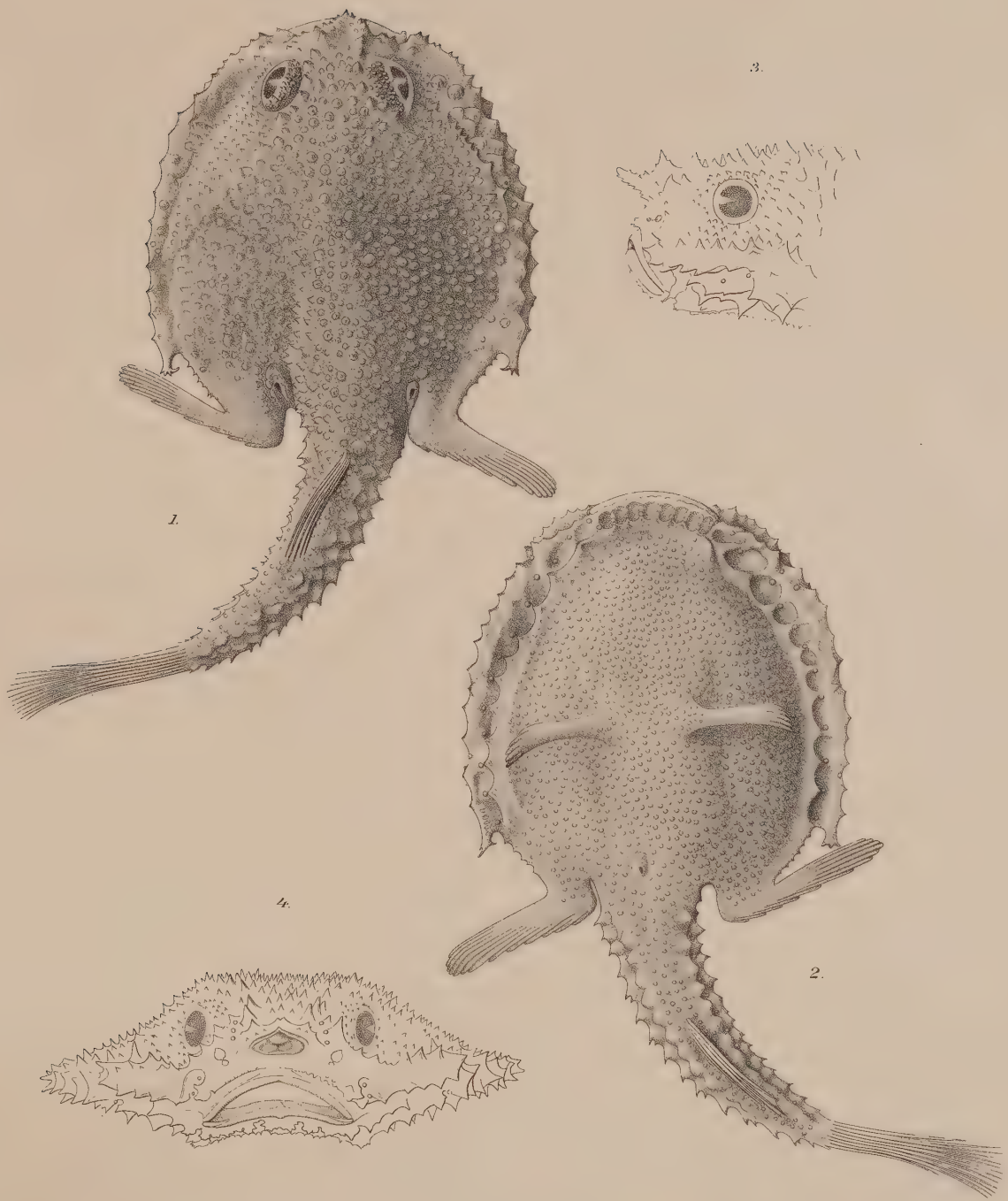

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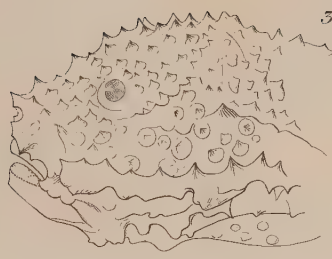
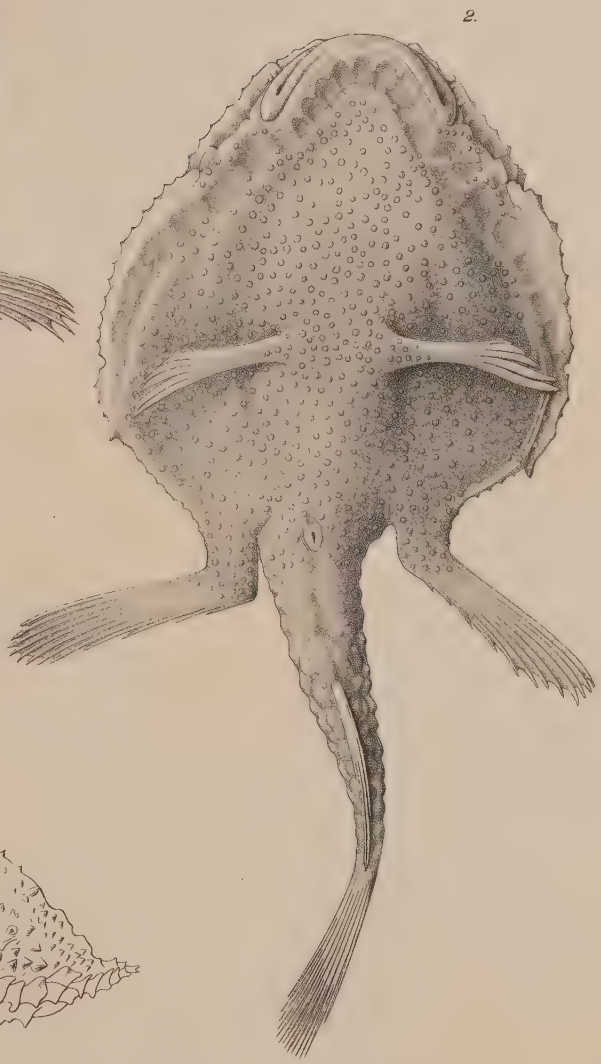
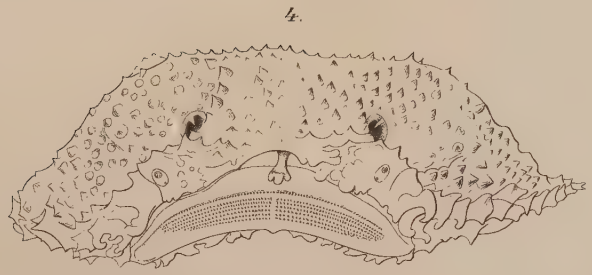
PLATE XX.

DIBRANCHOPSIS SPONGIOSA Gilb. Page 97.







A.M.Westergren del. B.Meisel, lith.

PLATE XXI.

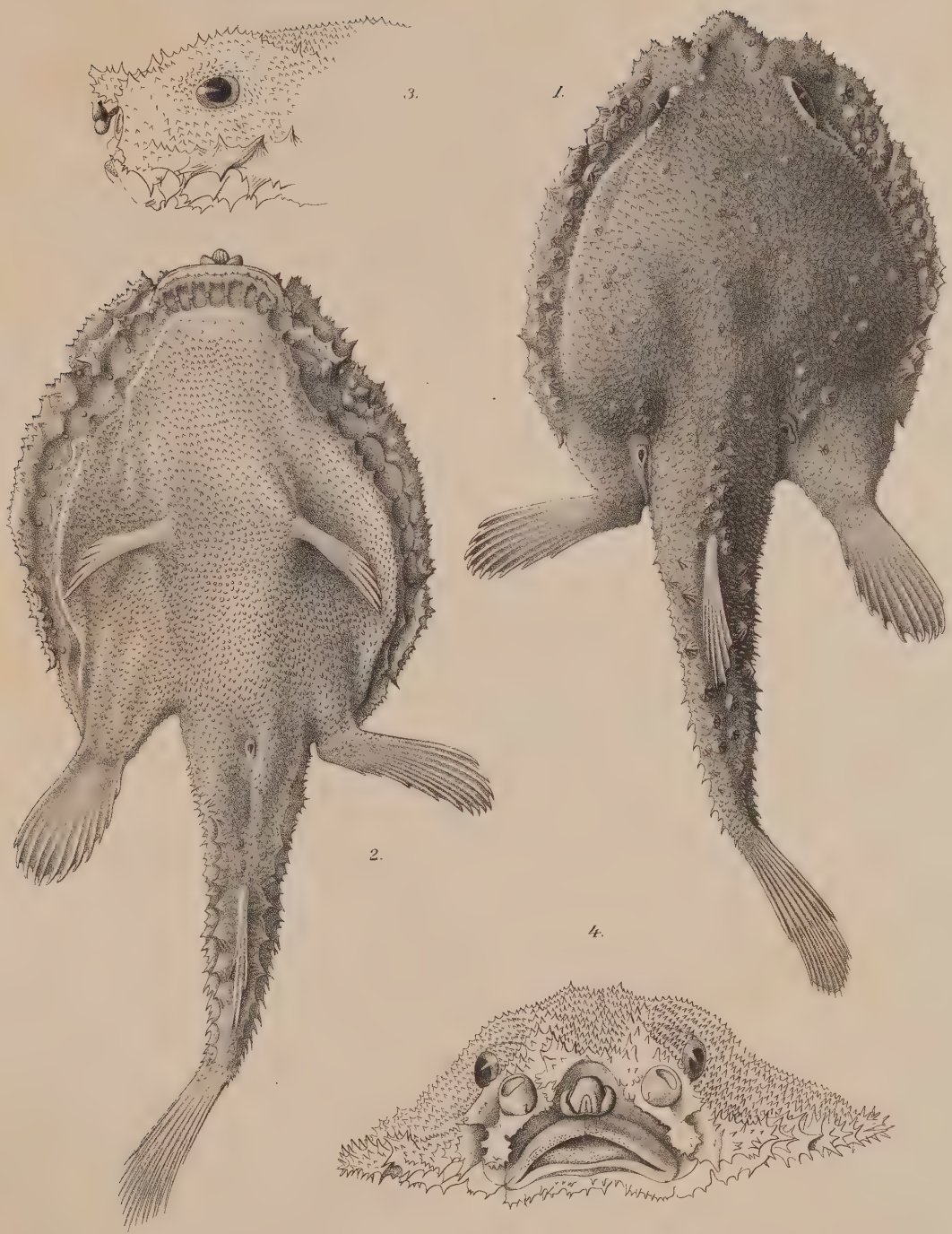
MALTHOPSIS SPINULOSA Garm. Page 106.

A.M. Westergren del.

B. Meisel. lith.

PLATE XXII.

MALTHOPSIS SPINOSA Garm. Page 104.



A.M. Westergren del. B. Meisel, lith

PLATE XXIII.

DIBRANCHUS HYSTRIX Garm. Page 92.

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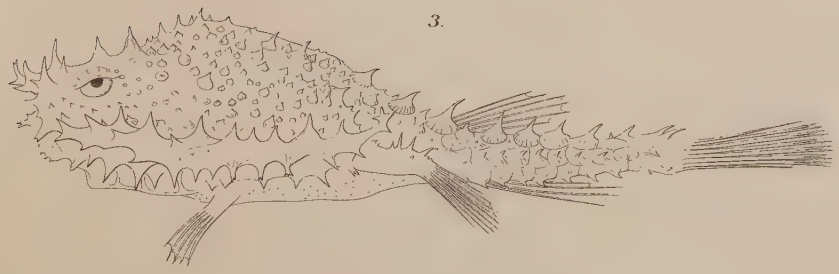
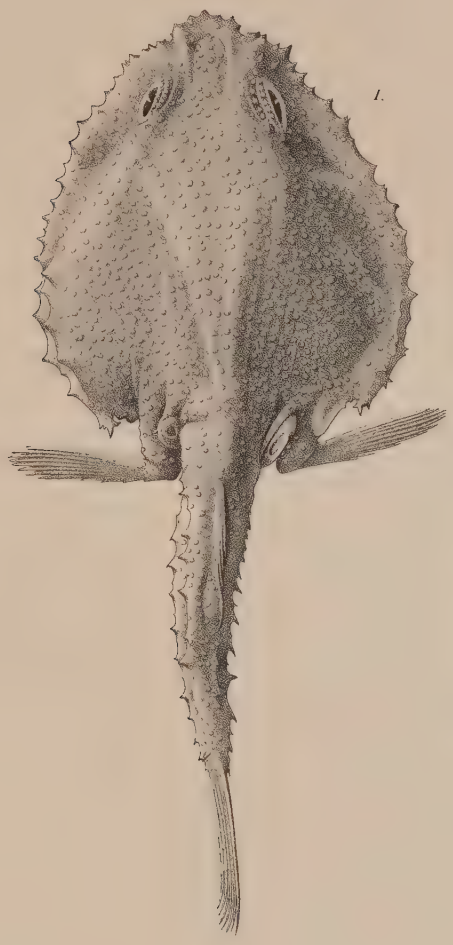


A.M.Westergren del.

B.Meisel, lith.

PLATE XXIV.

DIBRANCHUS SCABER Garm. Page 94.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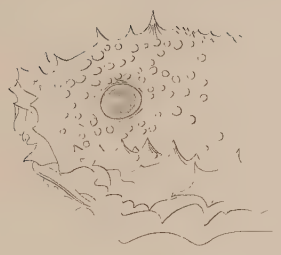
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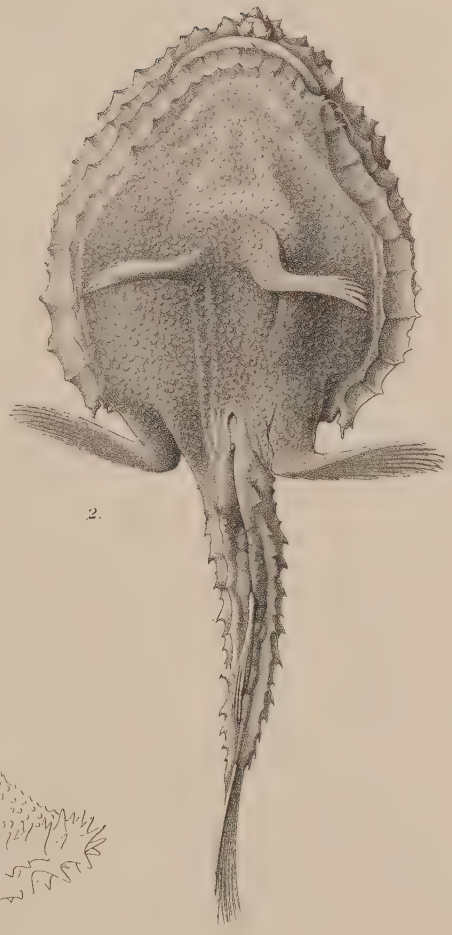
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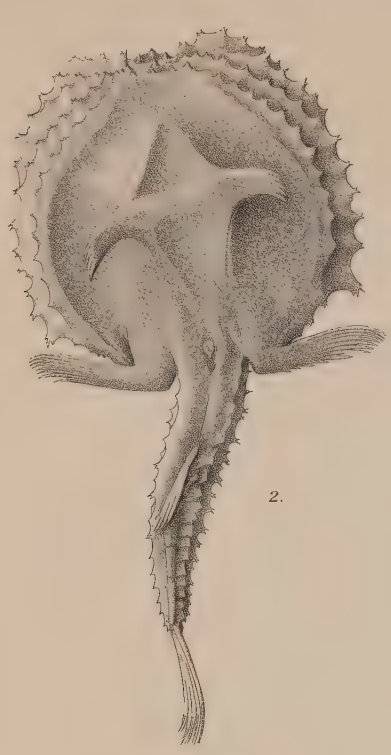
PLATE XXV.

HALIEUTOPSIS TUMIFRONS Garm. Page 90.



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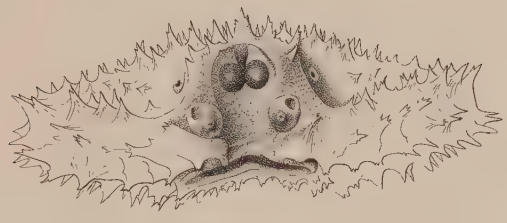


3.

5.

B.Meisel, lith.

A.M.Westergren del.

PLATE XXVI.

MALTHOPSIS SPINULOSA Garm. Page 106.

Fig. 1. Dorsal view of the skeleton.

Fig. 2. Ventral aspect of the skeleton.

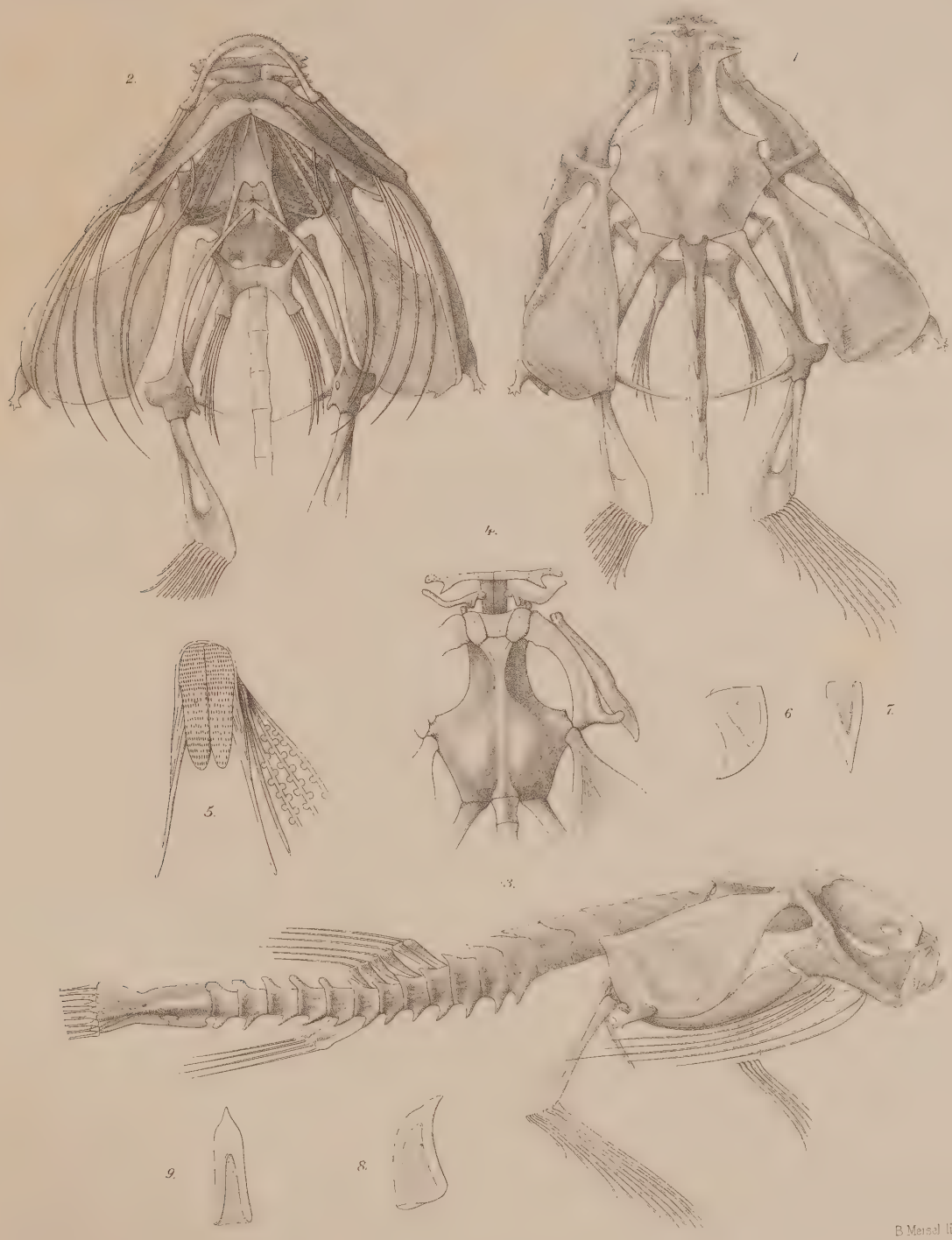
Fig. 3. Appearance of the skeleton from the side.

Fig. 4. Skull from below, showing the palatine, vomerine, and intermaxillary teeth.

Fig. 5. Upper surface of the tongue, with teeth and ends of branchial arches.

Figs. 6–7. An upper tooth, from front and side, enlarged.

Figs. 8–9. A lower tooth, from front and side, enlarged.



A.M. Westergren del.

B. Meisel lith.

PLATE XXVII.

Fig. 1. Careproctus longifilis Garm. Page 115.

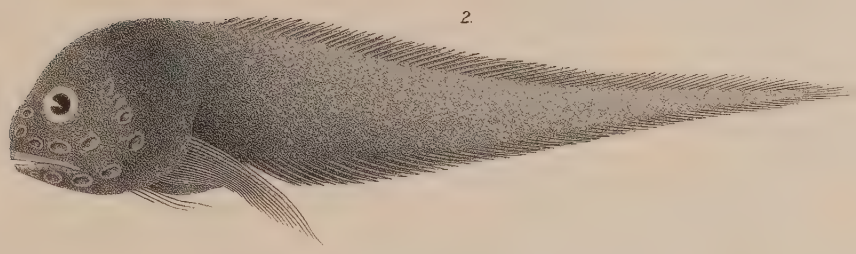
Fig. 2. Paraliparis latifrons Garm. Page 120.

Fig. 3. Paraliparis attenuatus Garm. Page 118.

Fig. 4. Paraliparis angustifrons Garm. Page 119.

1.

2.



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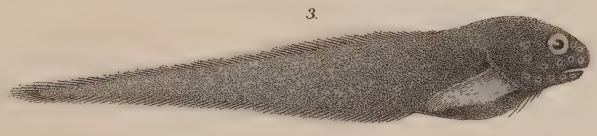
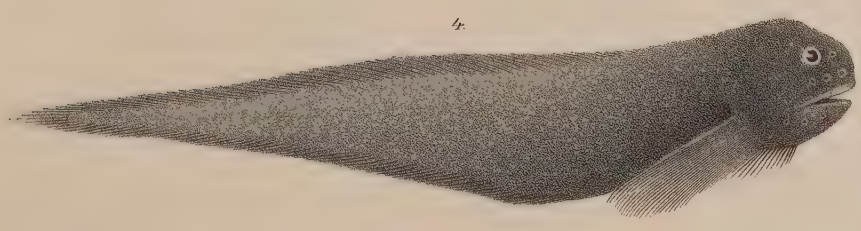


4.



B. Meisel, lith

A. M. Westergren, del.

PLATE XXVIII.

Fig. 1. CAREPROCTUS LONGIFILIS Garm. Page 115.

Fig. 2. PARALIPARIS LATIFRONS Garm. Page 120.

Fig. 2^{a}. Scapulary arch, with pectoral skeleton, and pelvic elements.

Figs. 2^{b}–2^{f}. Different views of the pelvis, from below, above, and the side.

Fig. 3. PARALIPARIS ATTENUATUS Garm. Page 118.

Fig. 4. PARALIPARIS ANGUSTIFRONS Garm. Page 119.

A.M.Westergren. del.

B.Meisel. lith.

PLATE XXIX.

Fig. 1. PARALIPARIS FIMBRIATUS Garm. Page 116.

Fig. 2. PARALIPARIS ATTENUATUS Garm. Page 118.

Fig. 3. PARALIPARIS ANGUSTIFRONS Garm. Page 119.

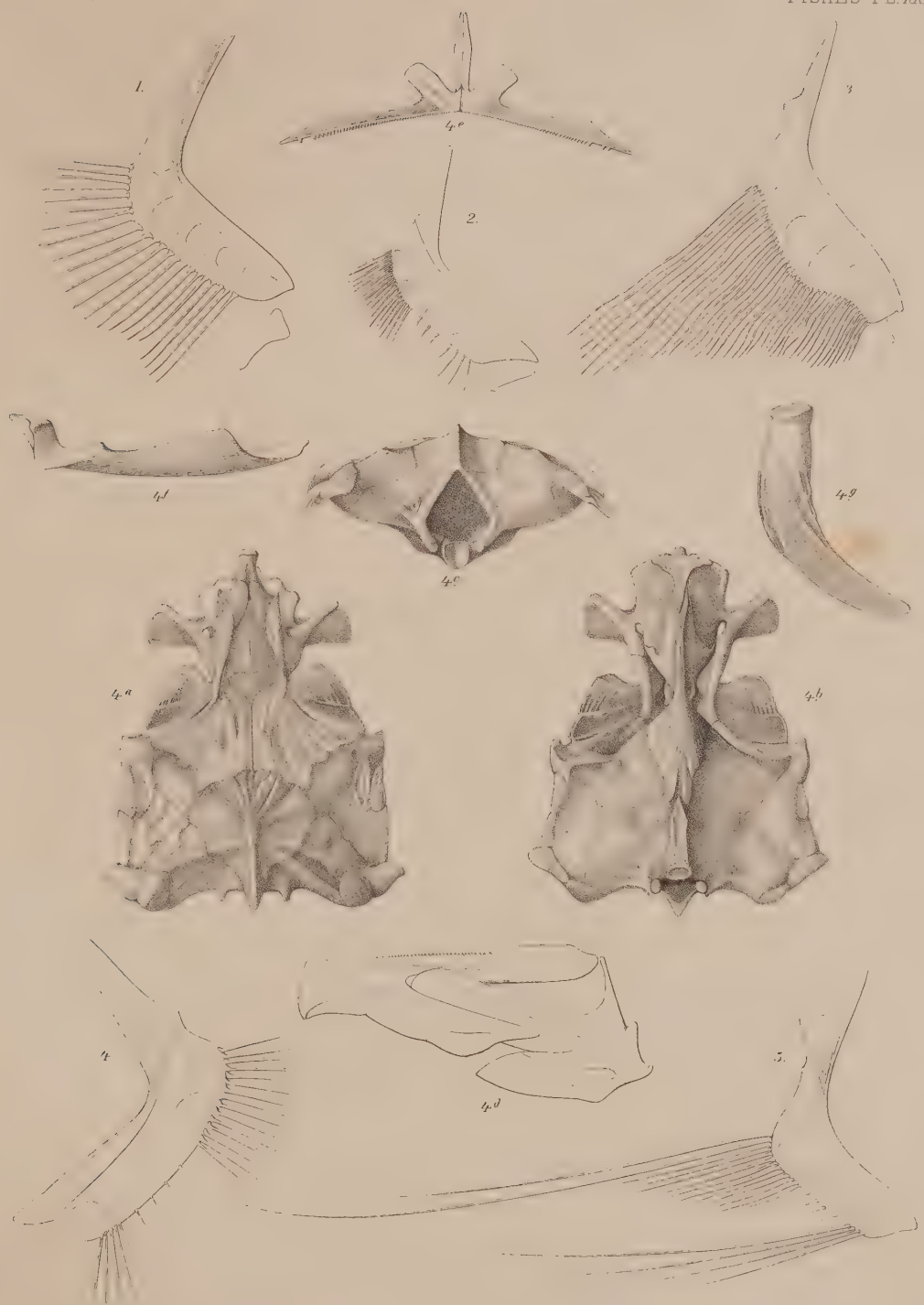
Fig. 4. PARALIPARIS GRANDICEPS Garm. Page 117.

Figs. 4^a–4^c. Skull of *P. grandiceps*.

Fig. 4^d. Lower jaw of same.

Figs. 4^e–4^g. Intermaxillaries, maxillary, and operculum of same.

Fig. 5. CAREPROCTUS LONGIFILIS Garm. Page 115.



A.M.Westergren, del. B.Meisel, lith.

PLATE XXX.

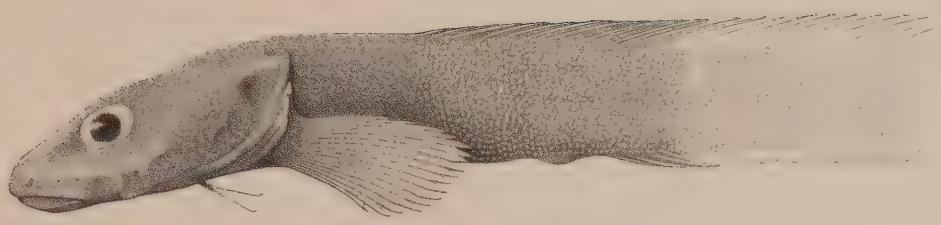
Fig. 1. LYCODES ANGUIS Garm. Page 133.

Fig. 2. LYCODES INCISUS Garm. Page 135.

Fig. 3. PHUCOCŒTES SUSPECTUS Garm. Page 137.

Fig. 4. *P. suspectus* as seen from below.

1.



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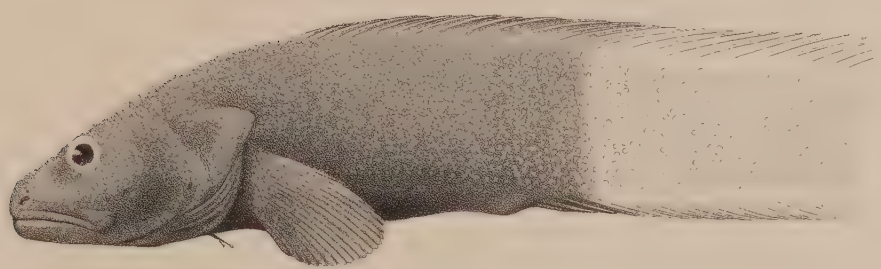
3.



3ª

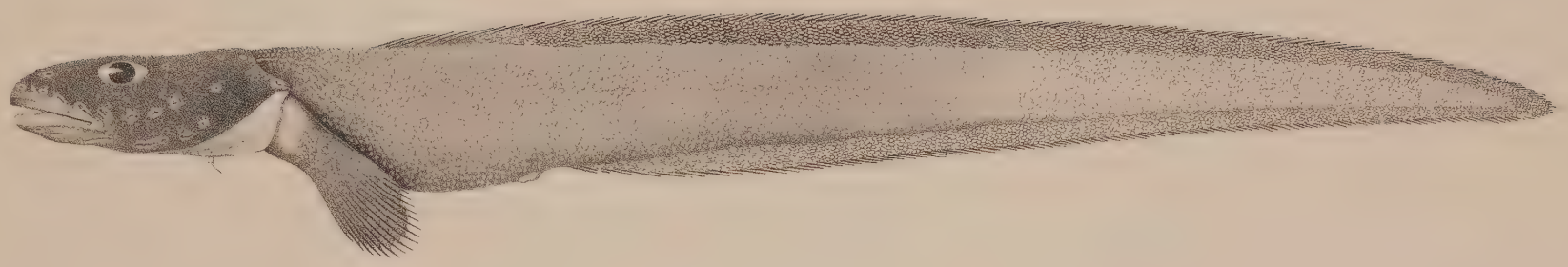
A.M. Westergren. del. B. Meisel. lith.

PLATE XXXI.

Fig. 1. Lycodes cicatrifer Garm. Page 136.

Fig. 2. Gymnelis conorhynchus Garm. Page 131.

1.



2.

A.M. Westergren, del.

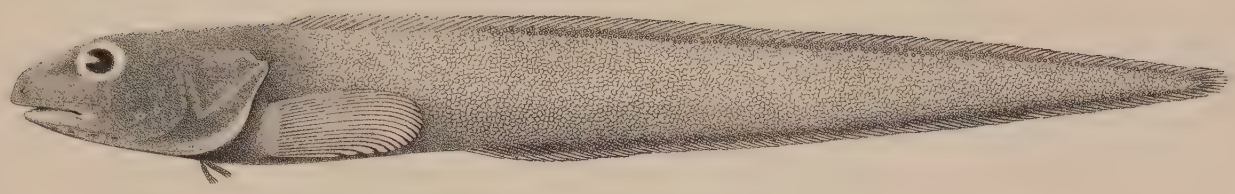
B. Meisel, lith.

PLATE XXXII.

Fig. 1. Lycodopsis scaurus Garm. Page 132.

Fig. 2. Bothrocaropsis alalonga Garm. Page 127.

1.



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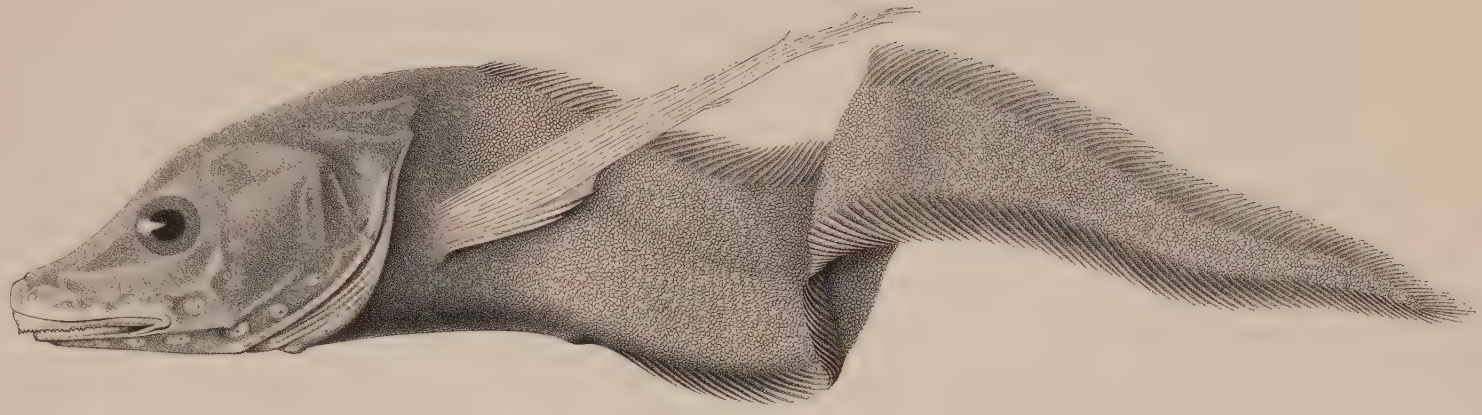


A.M.Westergren, del.

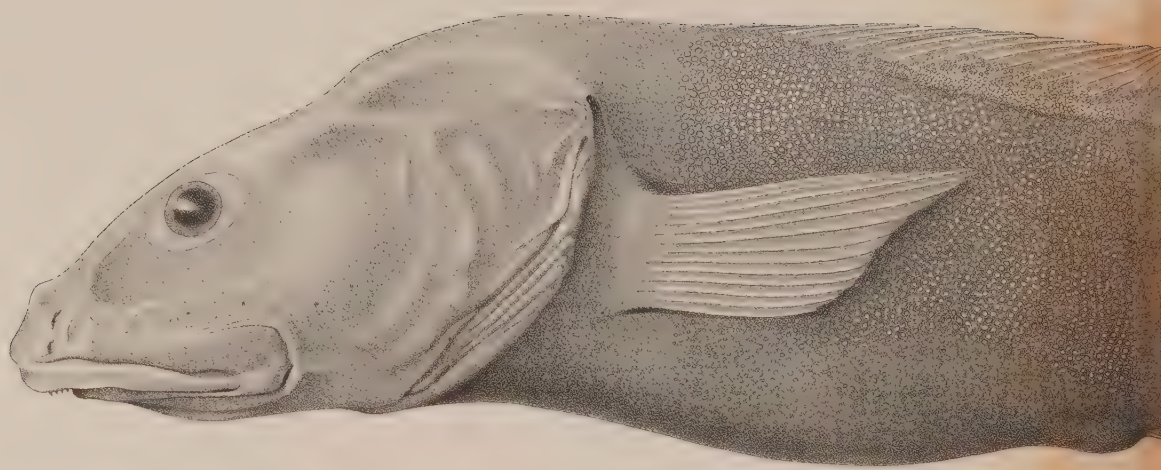
B.Meisel, lith.

PLATE XXXIII.

Fig. 1. Bothrocaropsis rictolata Garm. Page 128.

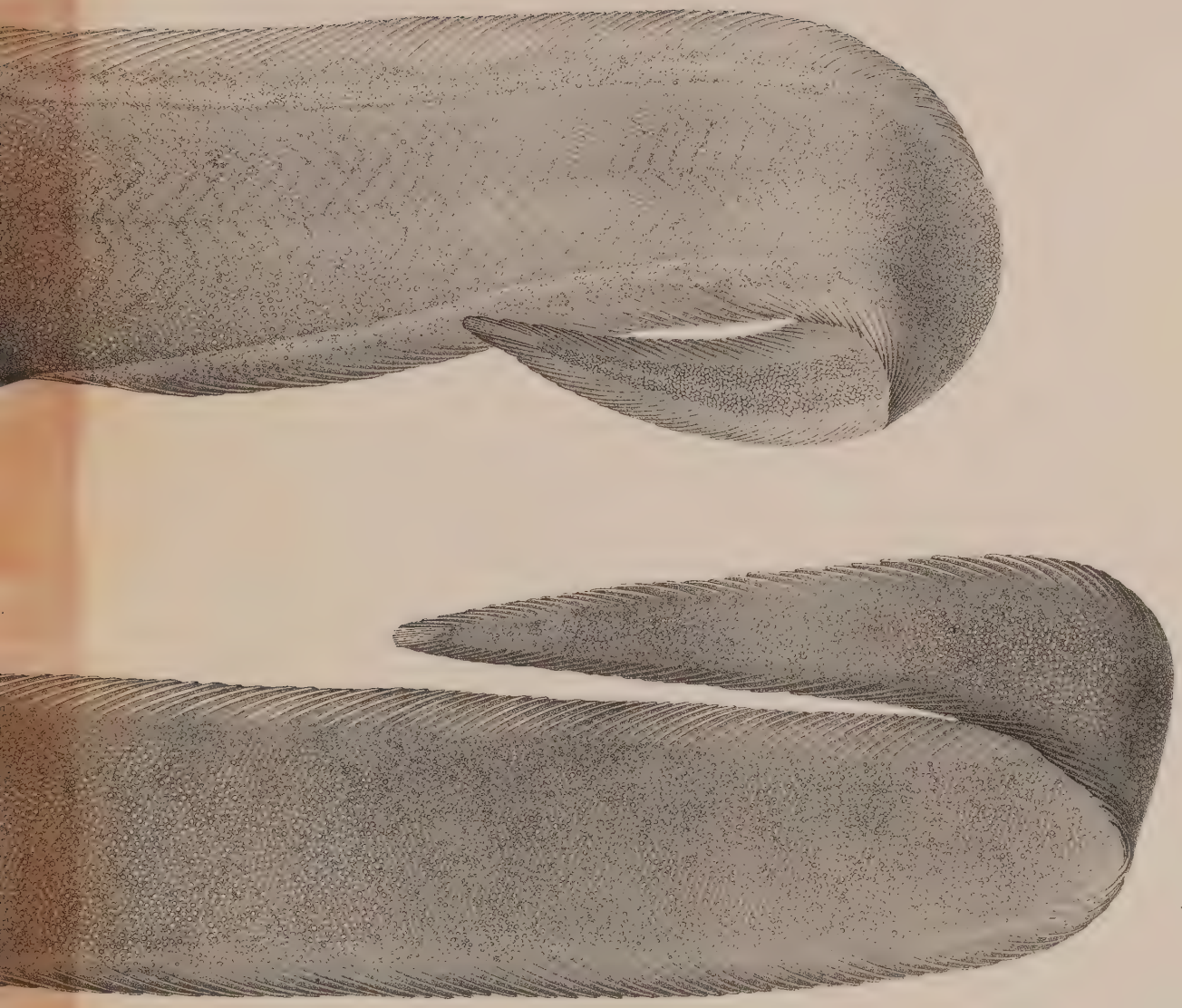
Fig. 2. Bothrocaropsis elongata Garm. Page 129.

1.



2

A.M.Westergren. del.



B Meisel, lith

PLATE XXXIV.

LAMPROGRAMMUS ILLUSTRIS Garm. Page 174.

Fig. 1. Outlines of the head and shoulders, showing the Lateral Canal System.

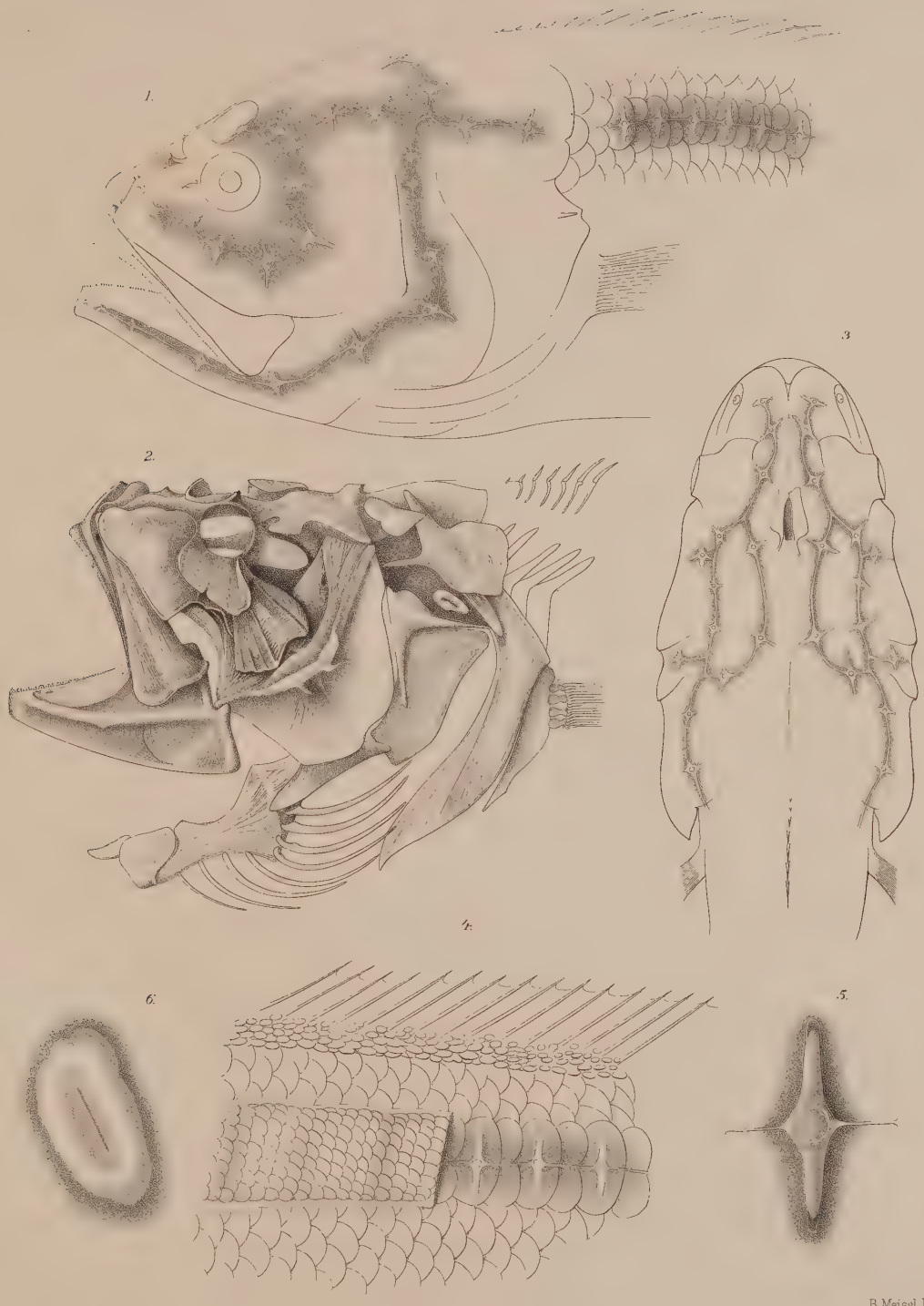
Fig. 2. Side view of the bones of the head and shoulders.

Fig. 3. Lateral Canal System as seen from above the head.

Fig. 4. Disks, scales, and coverings of the Lateral System on the flanks.

Fig. 5. Disk of the Lateral System, enlarged.

Fig. 6. Subopercular gland, enlarged, seen also in fig. 2.



A M Westergren, del.

B. Meisel, lith.

PLATE XXXV.

ERETMICHTHYS PINNATUS Garm. Page 165.

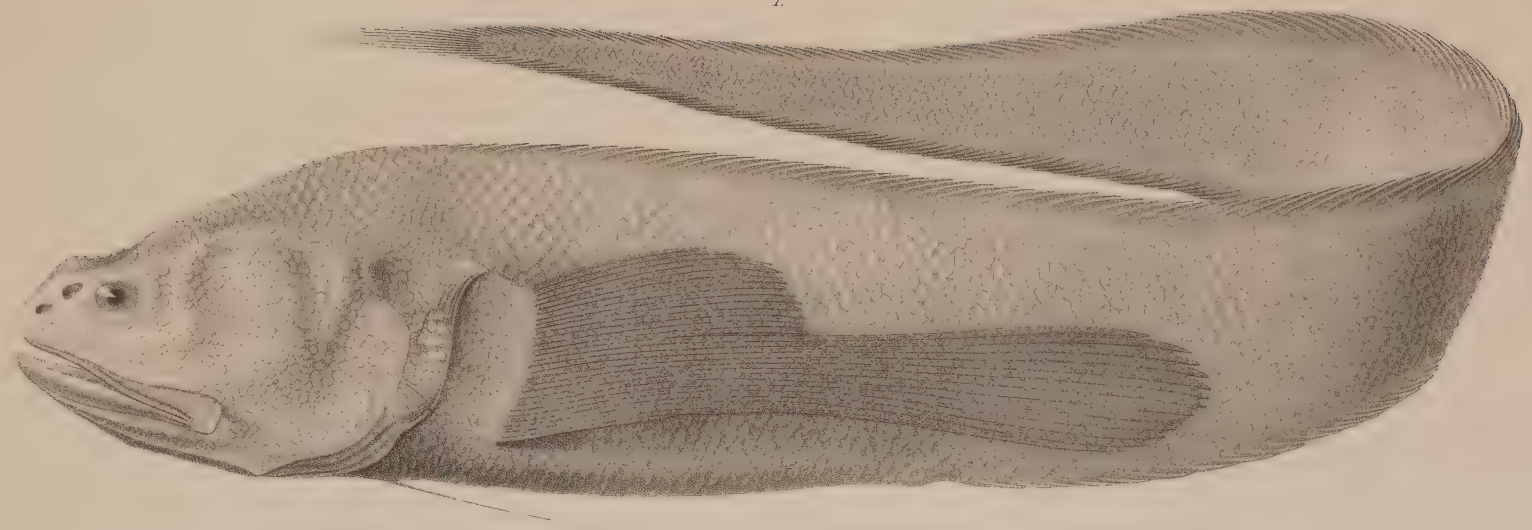
Fig. 1. Appearance as seen from the left side.

Fig. 2. Bones of shoulder girdle and pectoral fin, outer view.

Fig. 3. Scapulary arch and pectoral bones, inner side, showing the different processes on the bases of the pectoral rays in the two parts of the fin for the vertical spread of the upper half and the longitudinal pull of the lower.

Fig. 4. One of the disks of the Lateral System, showing the distribution of the nervules.

1.



2.

4.

3.

A.M. Westergren, del. B. Meisel, lith.

PLATE XXXVI.

Fig. 1. HOLCOMYCTERONUS DIGITTATUS Garm. Page 163.

Fig. 1ª. Inner side of scapulary arch with pelvis of *H. digittatus*, showing processes for muscle attachments to pectoral rays.

Fig. 1ᵇ. Inner sides of the basal portions of a couple of the pectoral rays of the same.

Fig. 2. MIXONUS CAUDALIS Garm. Page 148.

Fig. 2ª. Inner side of scapulary arch, pectorals, and pelvis, with ventral of *M. caudalis*.

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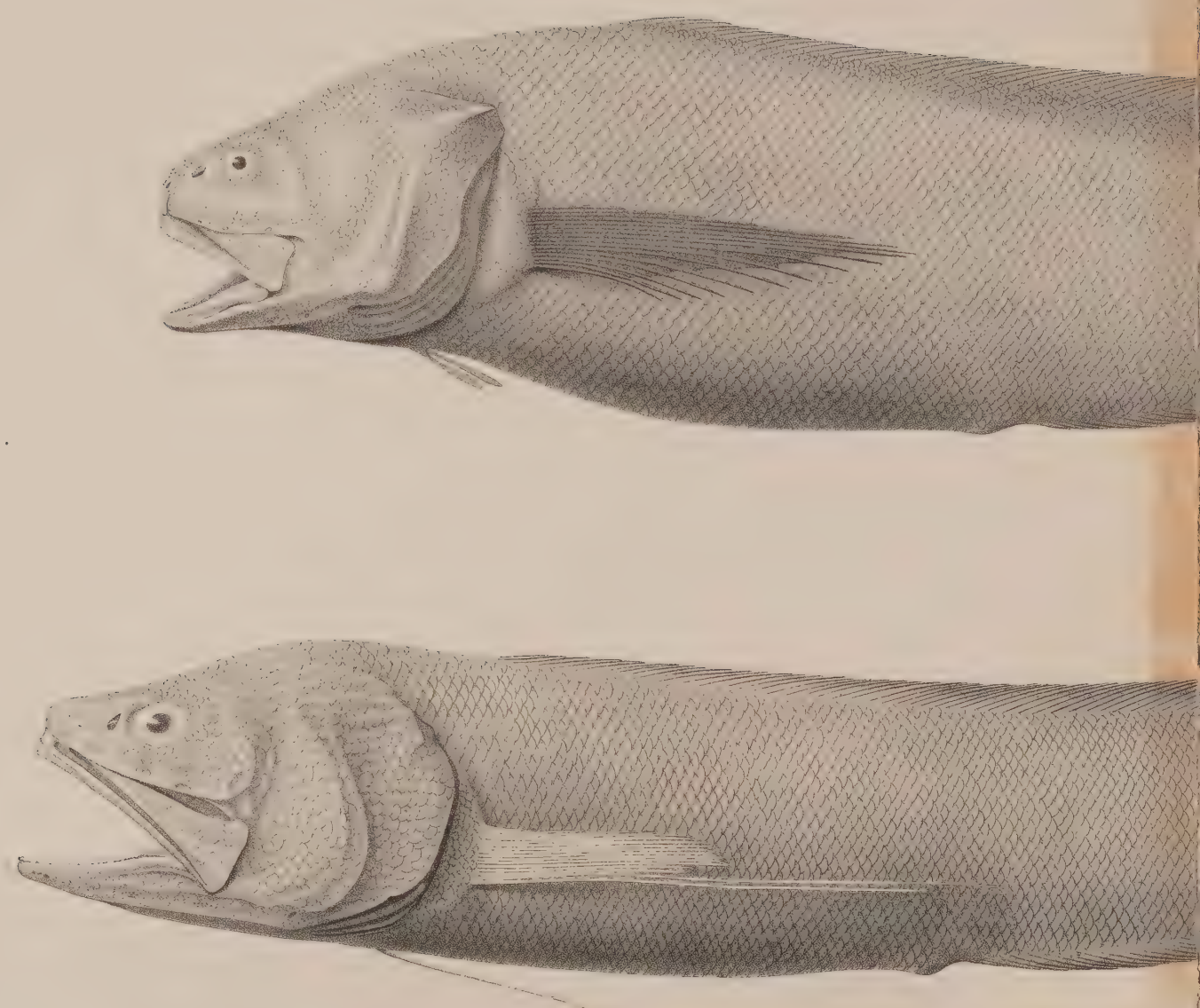
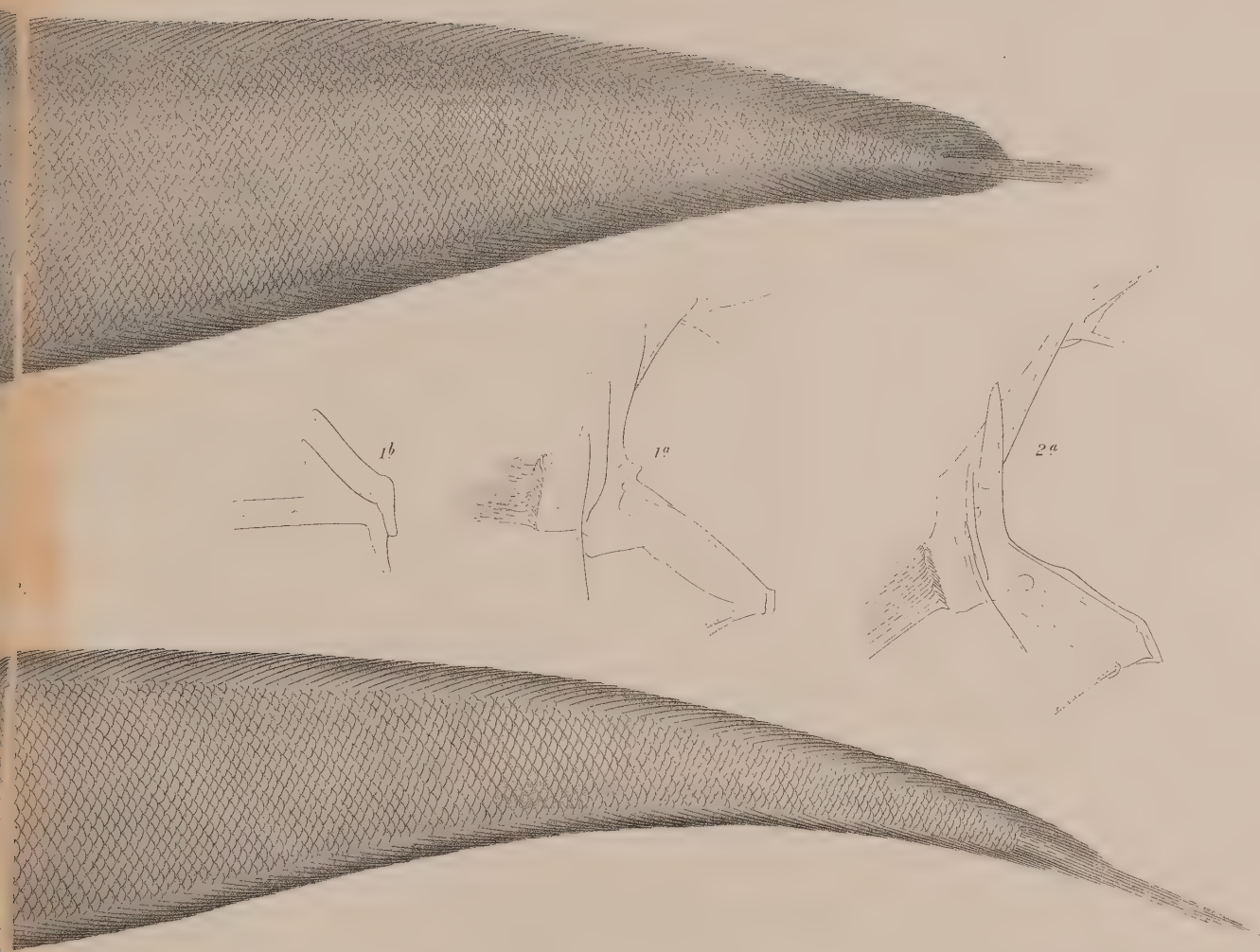


A.M.Westergren.del.



B Meisel, lith.

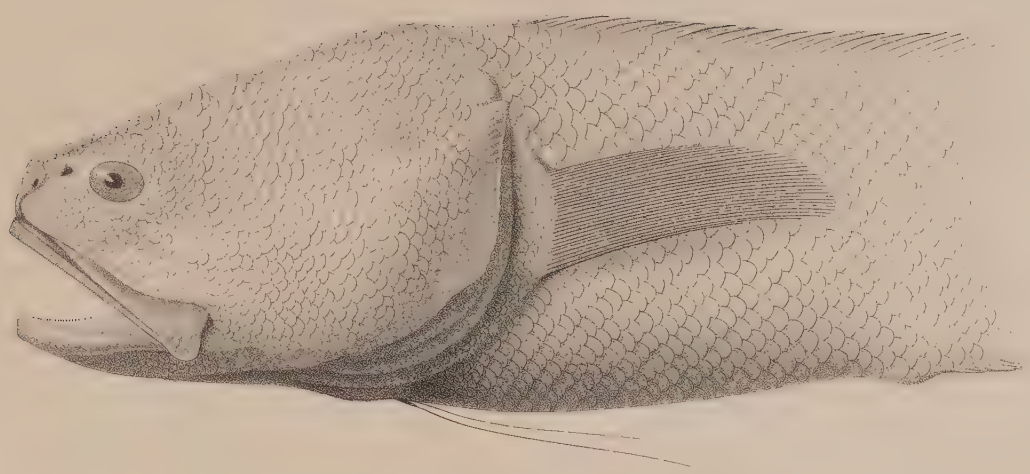
PLATE XXXVII.

Fig. 1. Eretmichthys ocella Garm. Page 166.

Fig. 2. Dicrolene nigra Garm. Page 150.

Fig. 3. Porogadus atripectus Garm. Page 154.

1.



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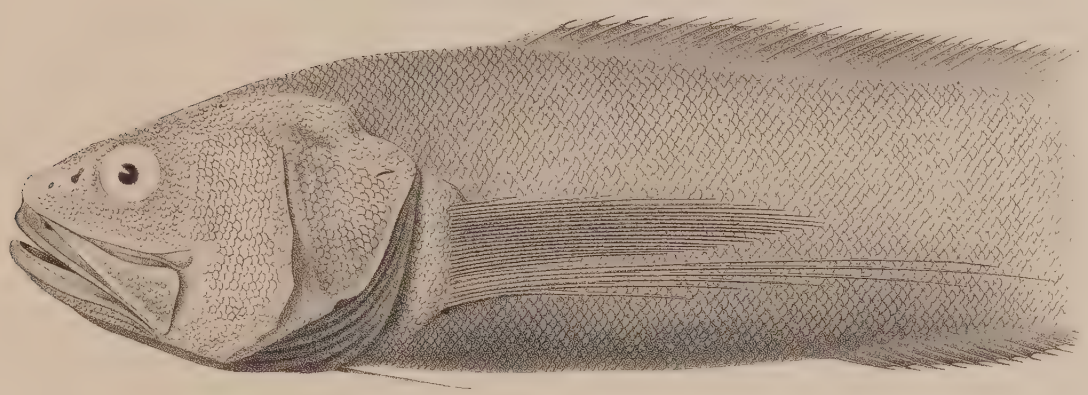

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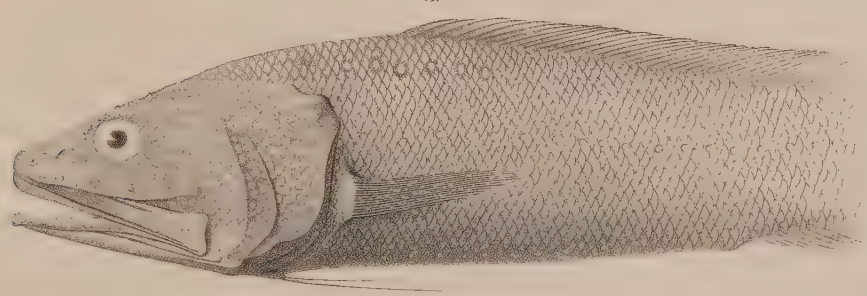


A.M.Westergren, del.

B.Meisel, lith.

PLATE XXXVIII.

LEUCICORUS LUSCIOSUS Garm. Page 146.

Fig. 1. Entire lateral aspect, from left side.

Fig. 2. Lateral System on the left side of the head.

Fig. 3. Lateral System as seen on the top of the head.

Figs. 4–6. The collapsed eyeball as on the outer and the inner side, and within after bisection.

Fig. 7. One of the disks of the Lateral System, from the cranial section of the canal.

PLATE XXXIX.

Fig. 1. PSEUDONUS ACUTUS Garm. Page 169.

Fig. 2. MIXONUS CAUDALIS Garm. Page 148.

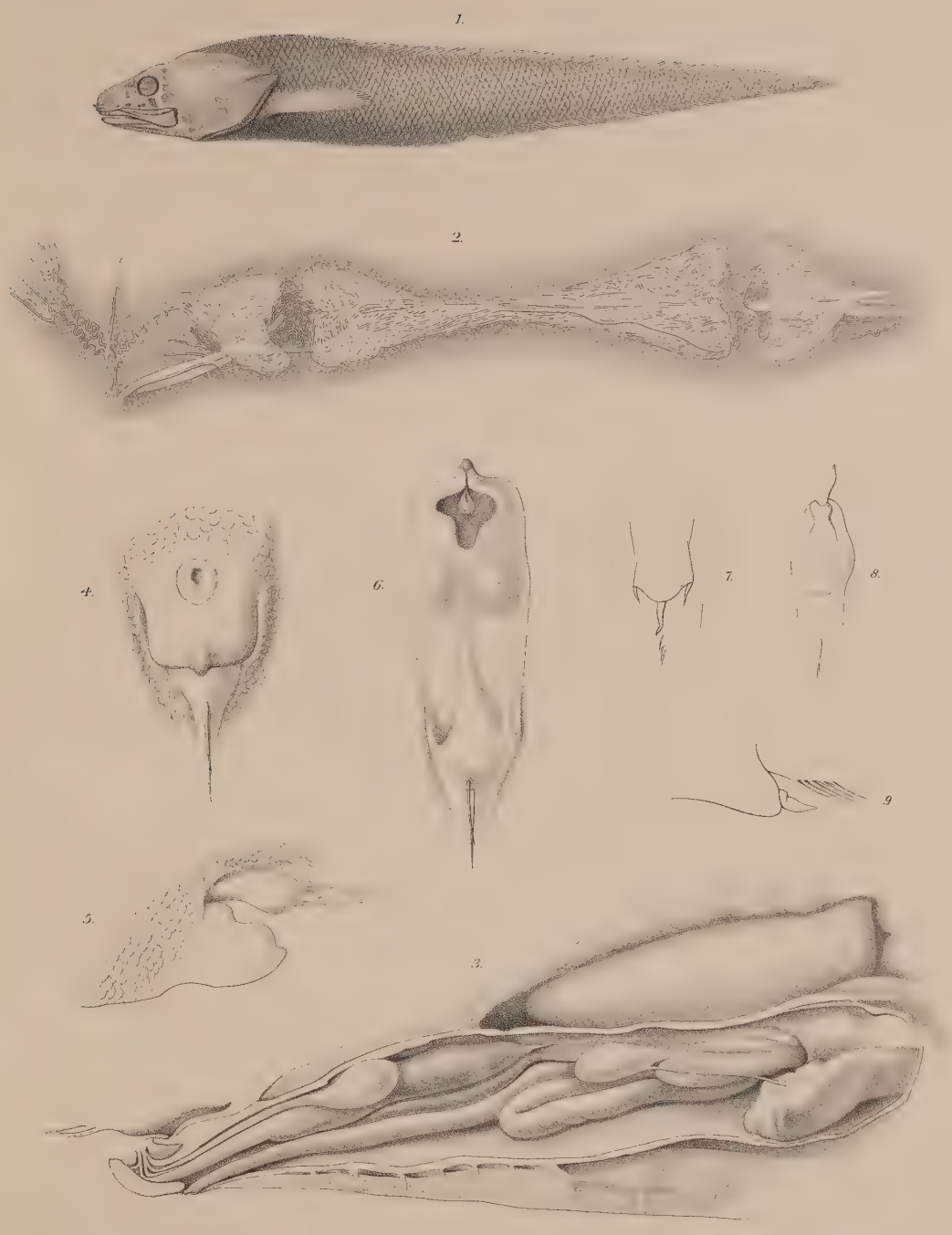
Disks of the Lateral System with nerves and connections.

Fig. 3. CATÆTYX SIMUS Garm. Page 168.

Viscera from the right side.

Fig. 4. Genital cage, papilla, etc. of *C. simus*, from below, from the side, and from above.

Fig. 5. Corresponding views of the Genital cage, etc. of *Barathronus bicolor* G. B.



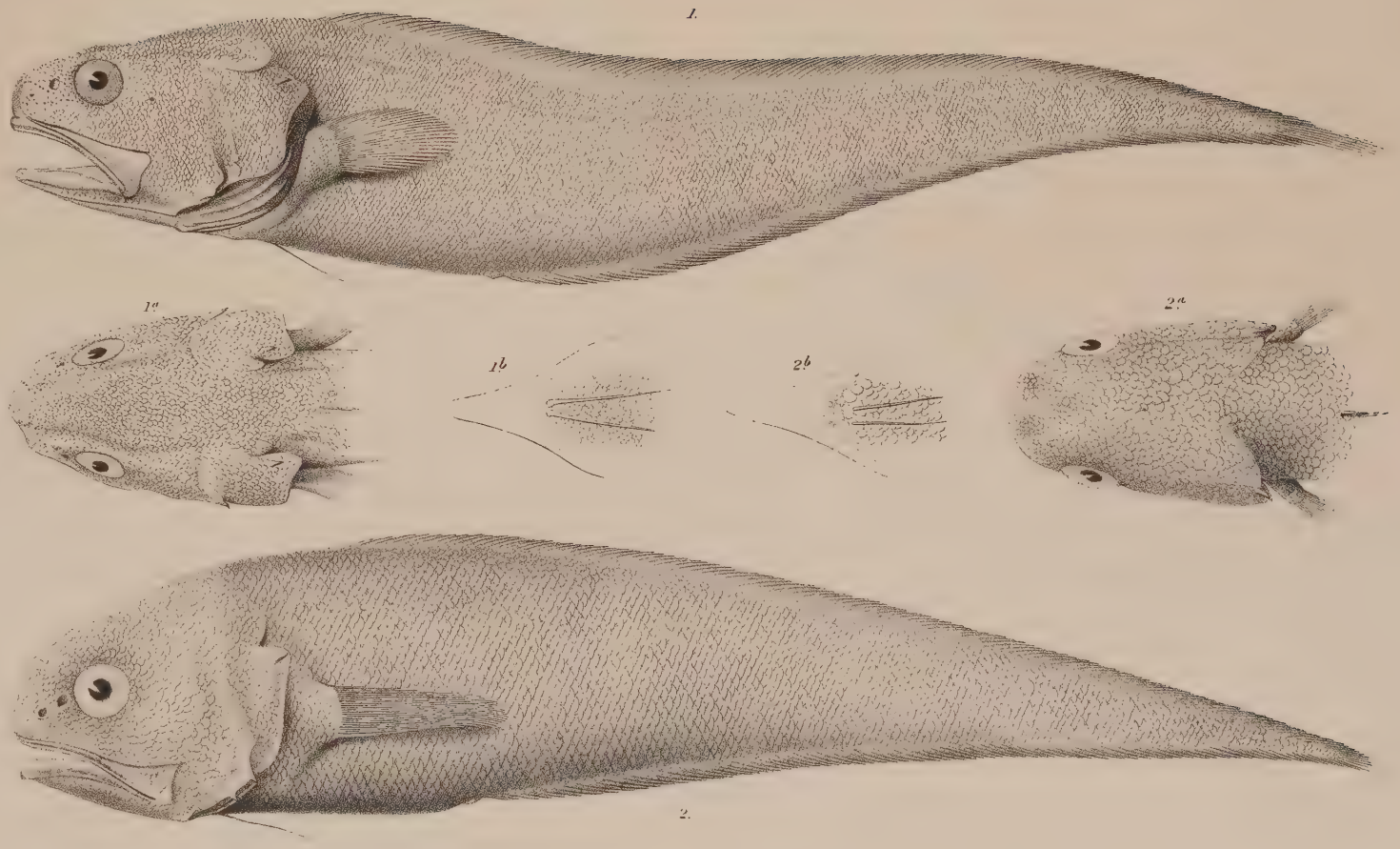
A.M Westergren, del.

B. Meisel, lith.

PLATE XL.

Figs. 1–1^{b}. Monomitopus torvus Garm. Page 157.

Figs. 2–2^{b}. Monomeropus malispinosus Garm. Page 158.



A.M.Westergren, del. B.Meisel. lith.

PLATE XLI.

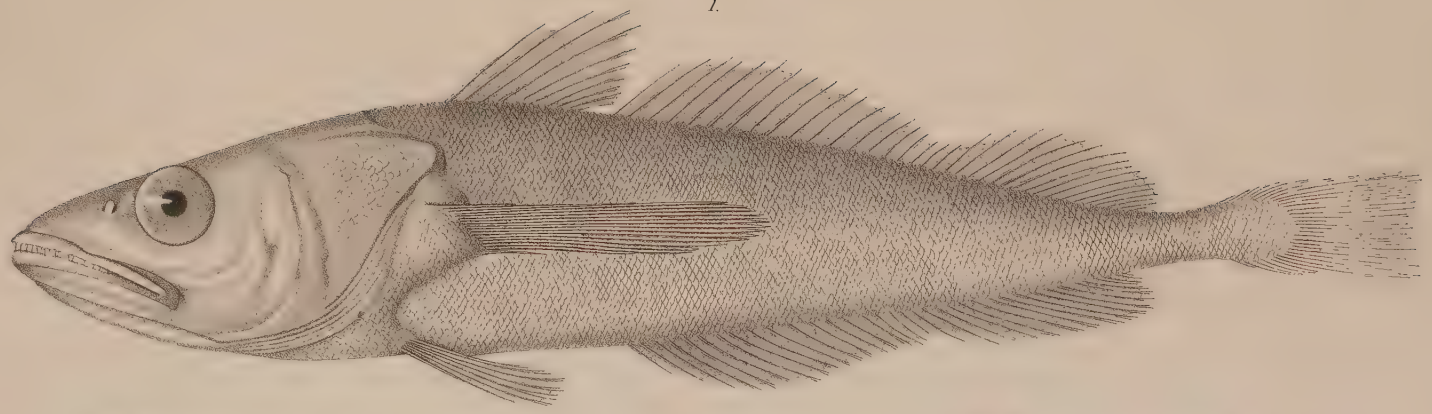
Fig. 1. MERLUCCIUS ANGUSTIMANUS Garm. Page 183.

Fig. 1ª. Disks of the Lateral System from the head of *M. angustimanus.*

Fig. 2. LEPTOPHYCIS FILIFER Garm. Page 182.

Fig. 2ª. Disks and connecting thread, of Lat. Syst., from head of *L. filifer.*

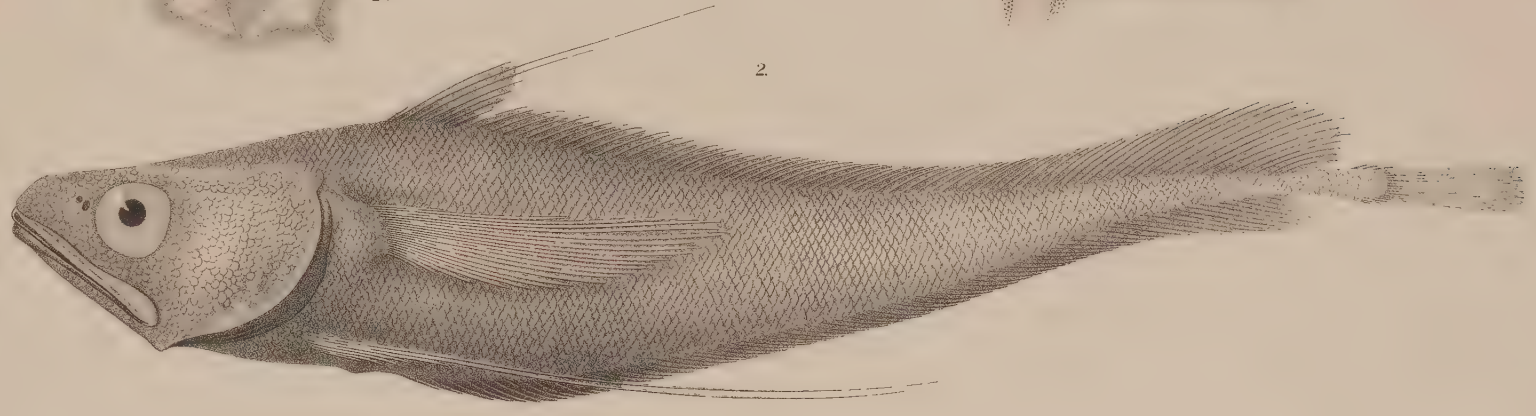
1.



2 a

1 a

2.



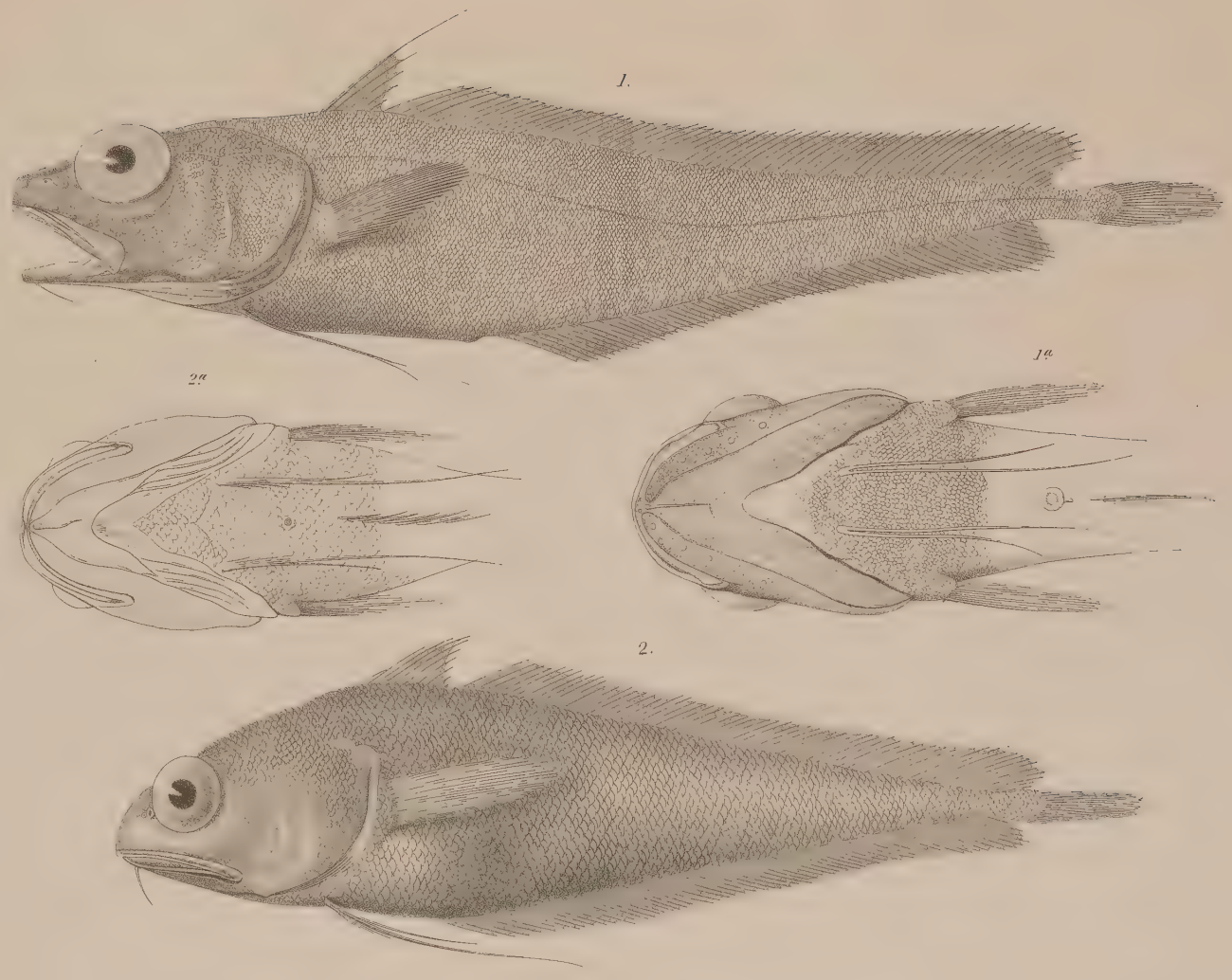
A.M.Westergren.del.

B.Meisel lit.

PLATE XLII.

Figs. 1–1ᵃ. Læmonema gracillipes Garm. Page 187.

Figs. 2–2ᵃ. Phyciculus longipes Garm. Page 188.



A.M.Westergren, del.

B. Meisel lith.

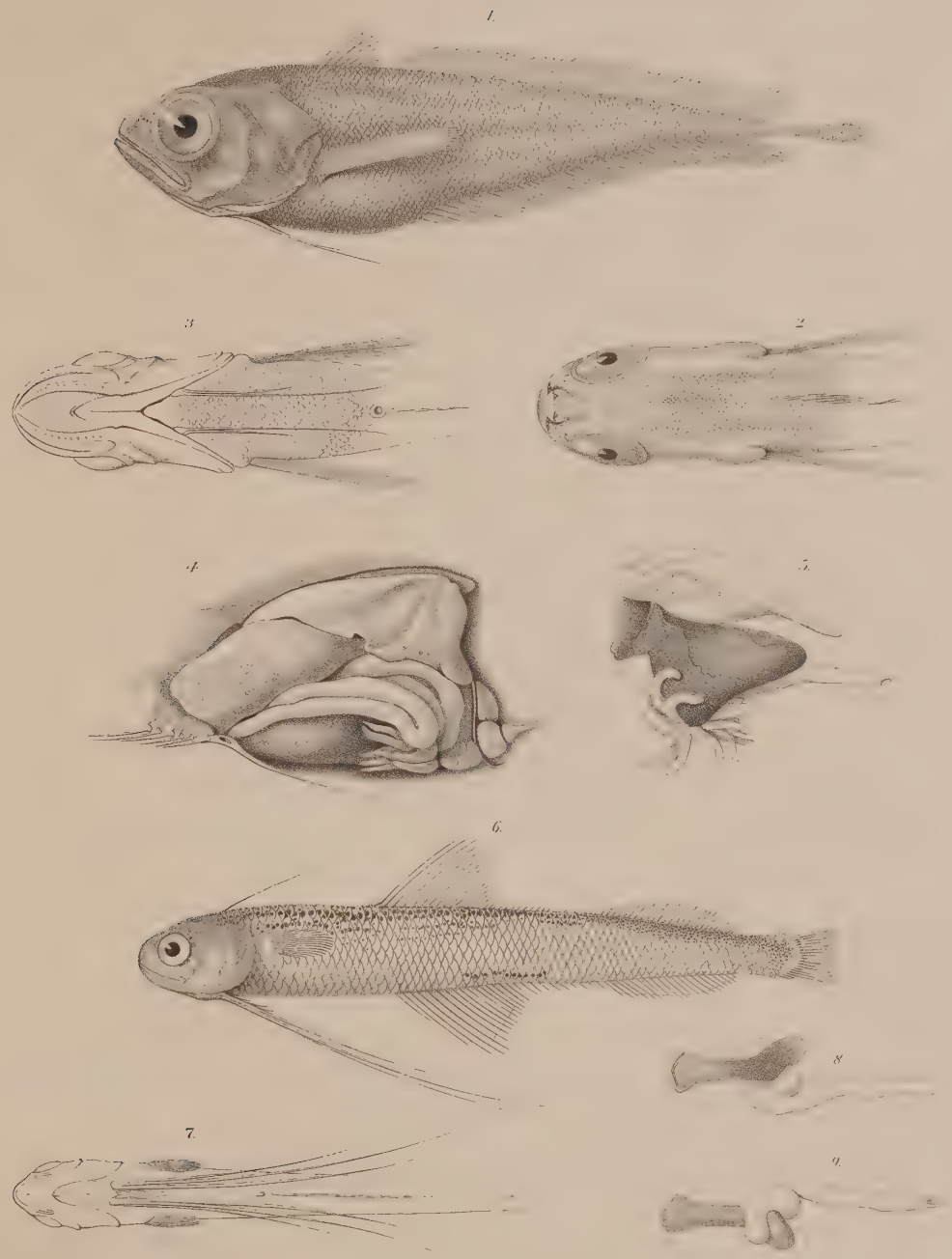
PLATE XLIII.

Figs. 1–3. MICROLEPIDIUM GRANDICEPS Garm. Page 181.

Figs. 4–5. Viscera of *M. grandiceps* from the right and from the left side.

Figs. 6–7. BREGMACEROS LONGIPES Garm. Page 191.

Figs. 8–9. Stomach and intestine of *B. longipes,* with pyloric cæca.

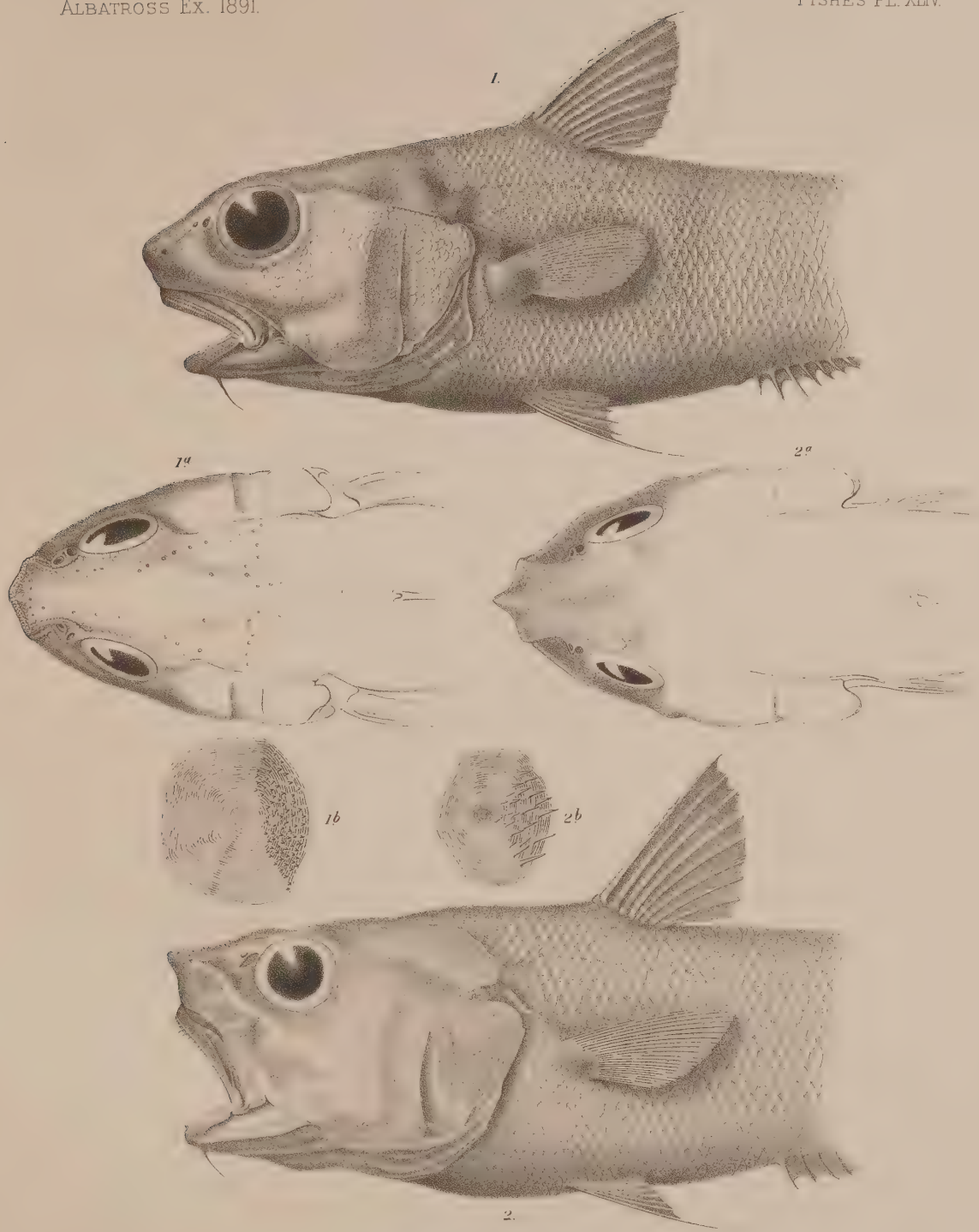


A.M. Westergren, del. B. Meisel lith.

PLATE XLIV.

Figs. 1–1^{b}. MACRURUS BULBICEPS Garm. Page 194.

Figs. 2–2^{b}. MACRURUS BUCEPHALUS Garm. Page 195.



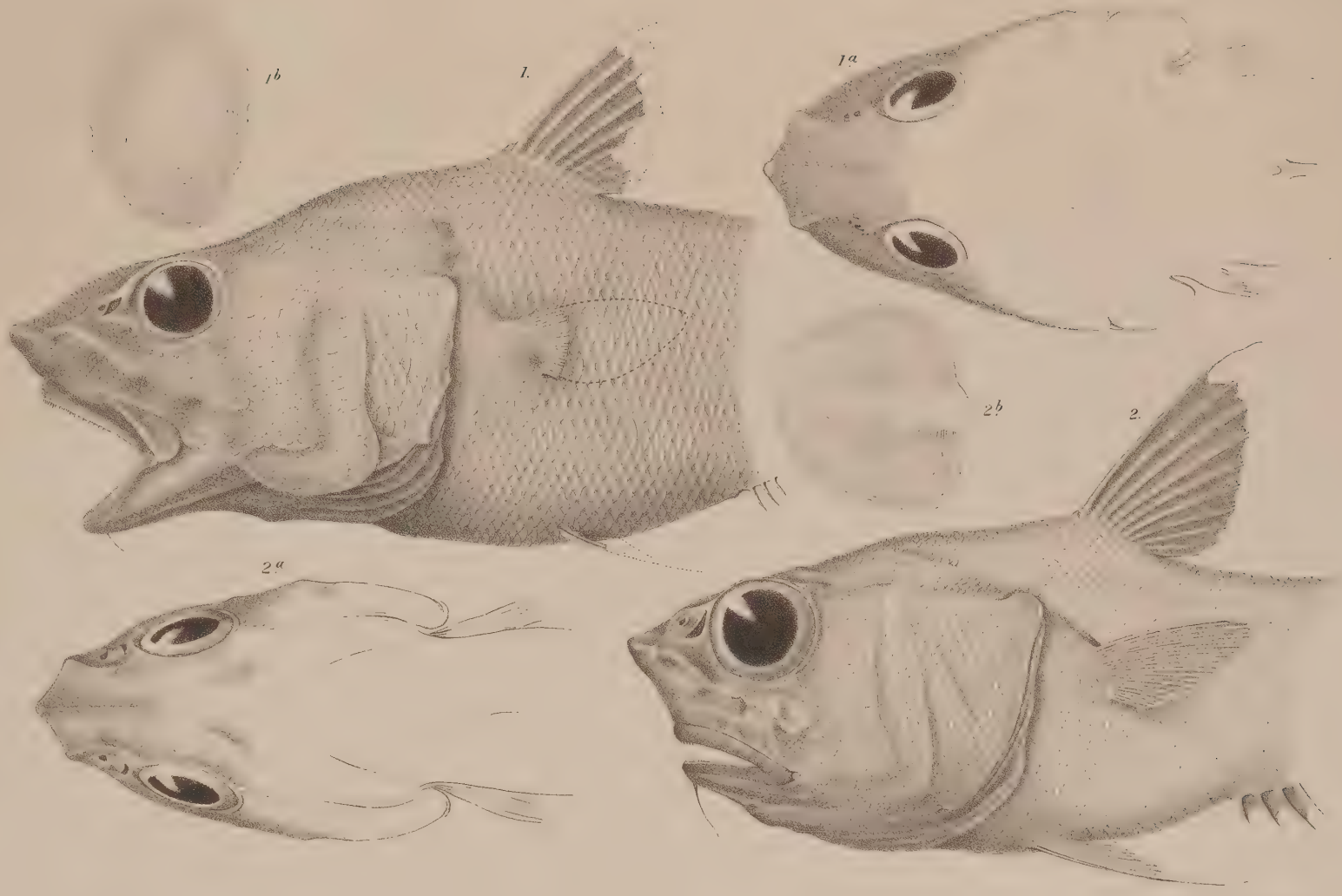
J. Henry Blake, del

B Meisel, lith.

PLATE XLV.

Figs. 1–1^{b}. MACRURUS LIRATICEPS Garm. Page 196.

Figs. 2–2^{b}. MACRURUS BARBIGER Garm. Page 197.



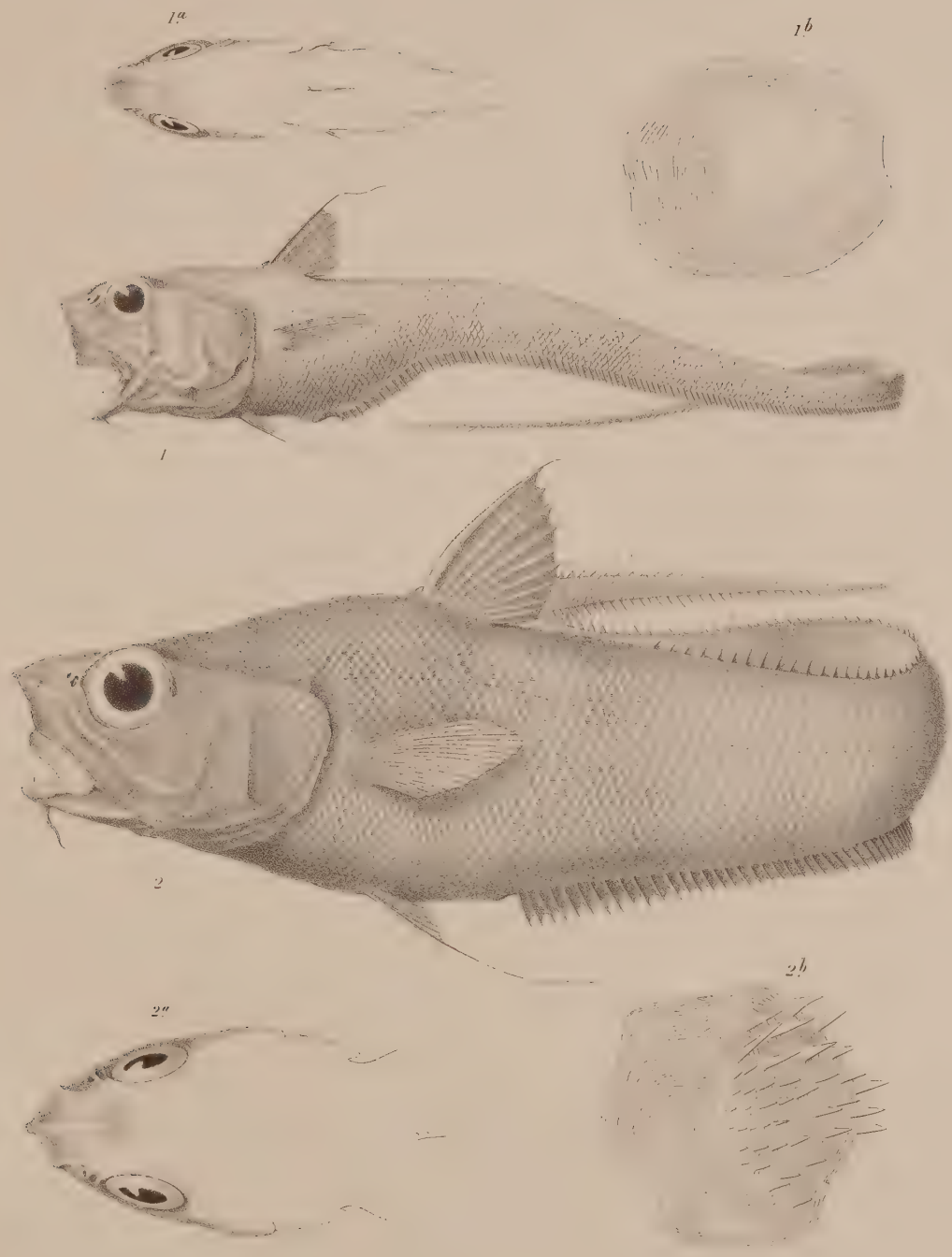
J Henry Blake. del

Mintern Bros. lith

PLATE XLVI.

Figs. 1–1^{b}. MACRURUS FRAGILIS Garm. Page 203.

Figs. 2–2^{b}. MACRURUS CARMINIFER Garm. Page 204.



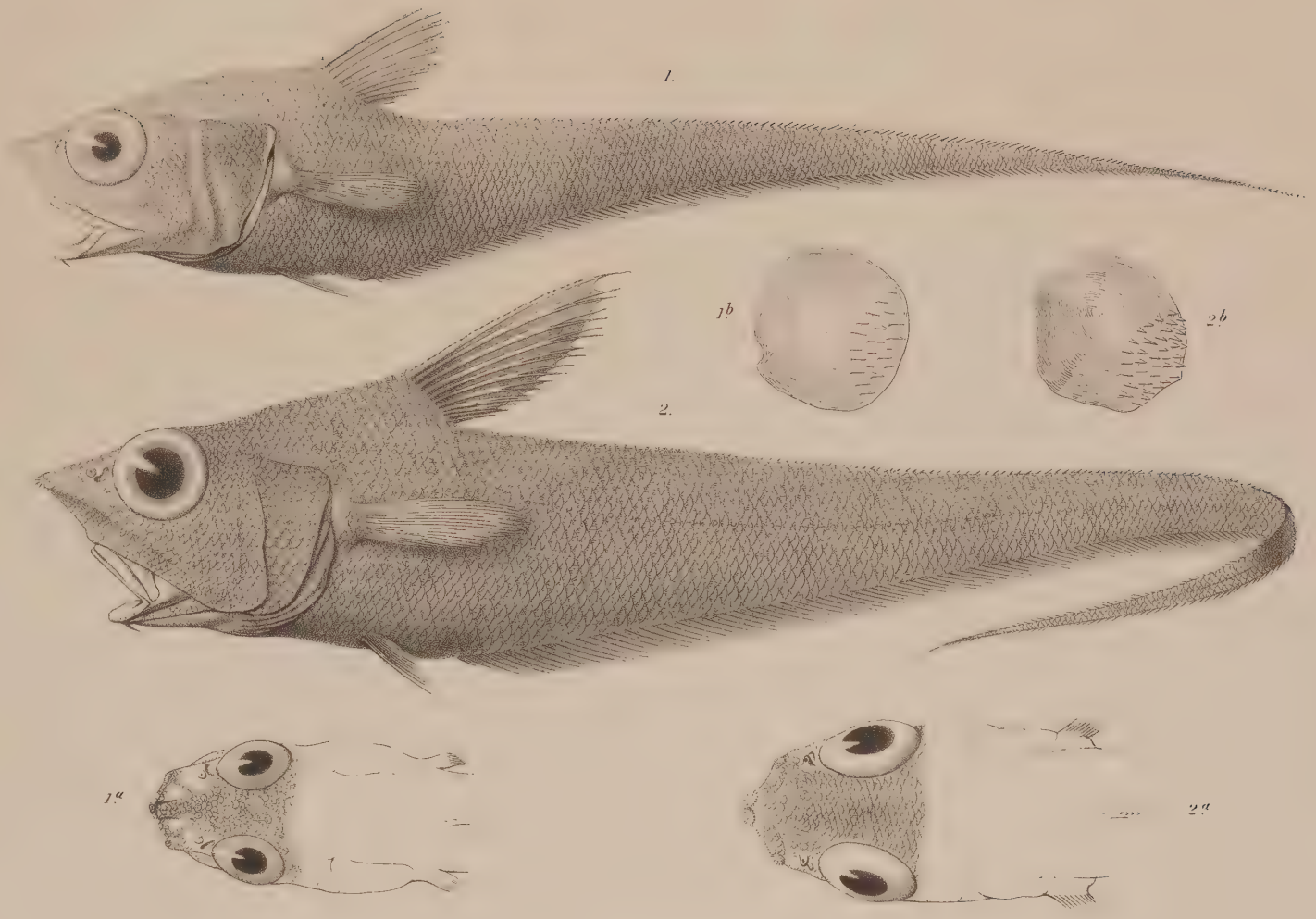
J. Henry Blake, del.

B. Meisel, lith.

PLATE XLVII.

Figs. 1–1^{b}. MACRURUS ORBITALIS Garm. Page 207.

Figs. 2–2^{b}. MACRURUS LORICATUS Garm. Page 208.



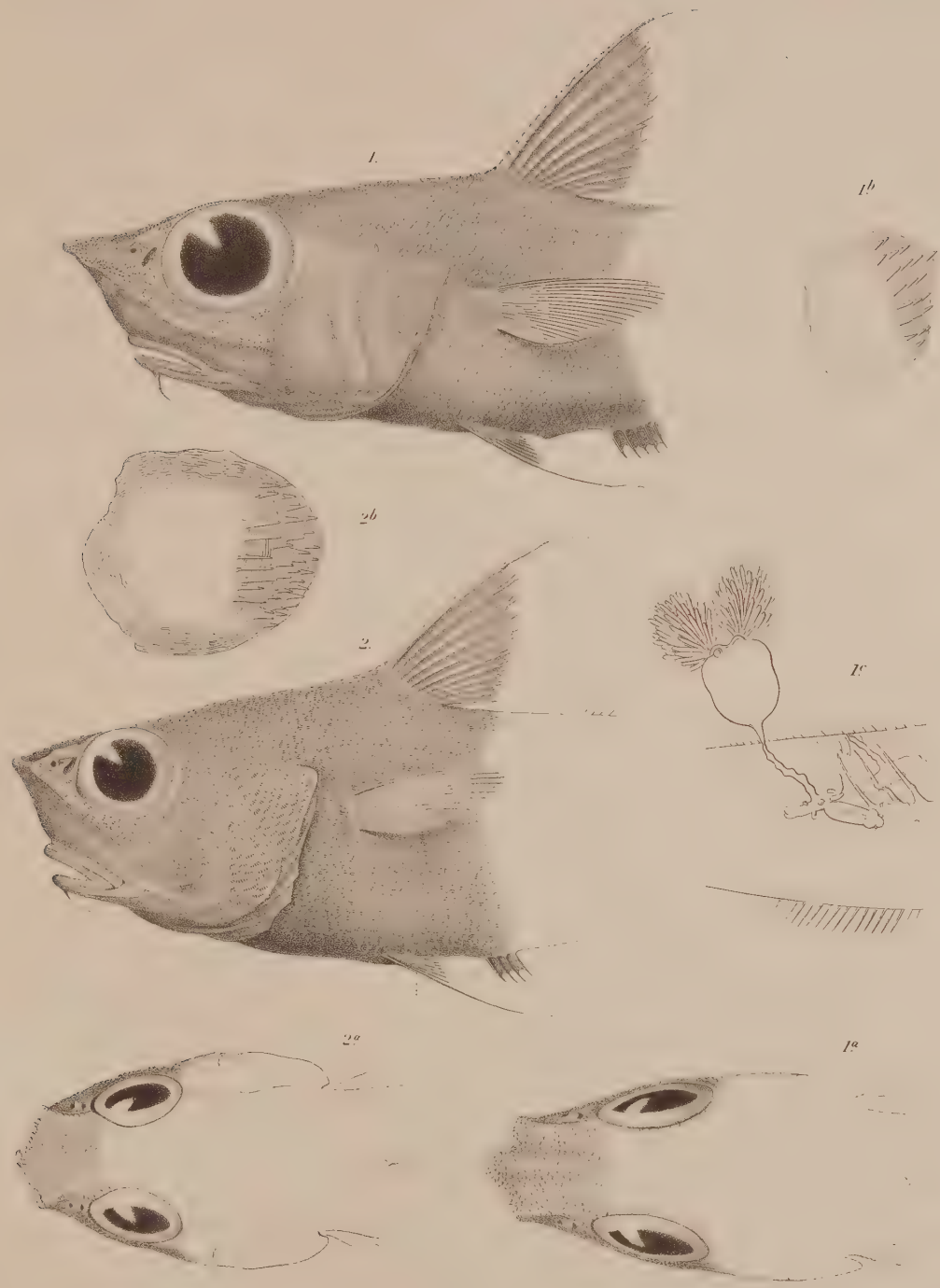
A.M.Westergren, del.

B Meisel lith.

PLATE XLVIII.

Figs. 1–1^{b}. MACRURUS CONVERGENS Garm. Page 210.

Figs. 2–2^{b}. MACRURUS LATIROSTRATUS Garm. Page 211.



J. Henry Blake, del.

B. Meisel, lith.

PLATE XLIX.

Figs. 1–1^{b}. MACRURUS TENUICAUDA Garm. Page 216.

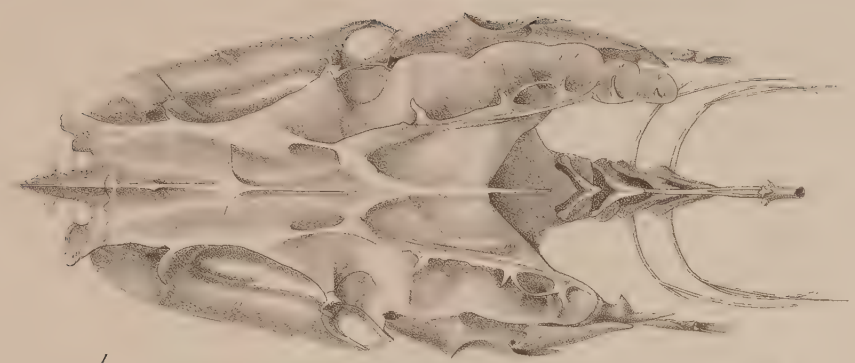
Figs. 2–2^{b}. MACRURUS CANUS Garm. Page 217.

A.M. Westergren, del.

B. Meisel. lith.

PLATE L.

MACRURUS ANGULICEPS Garm. Page 212.



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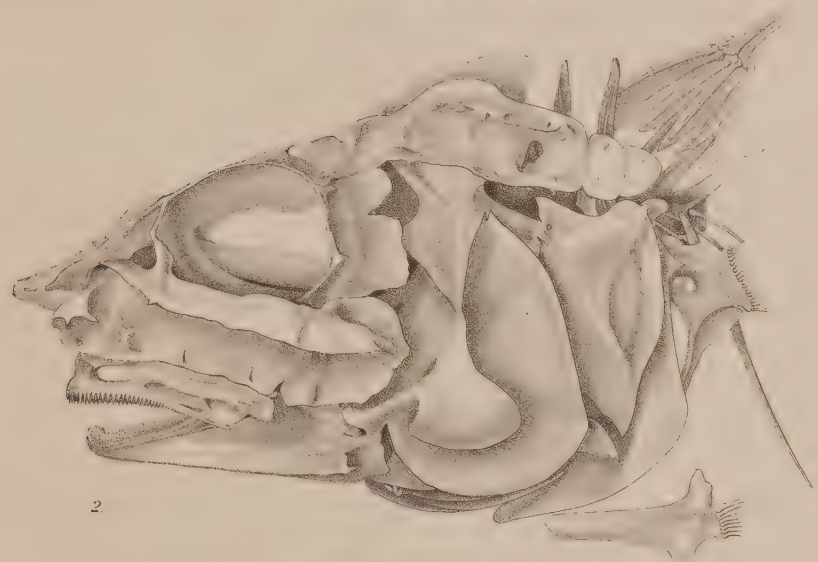
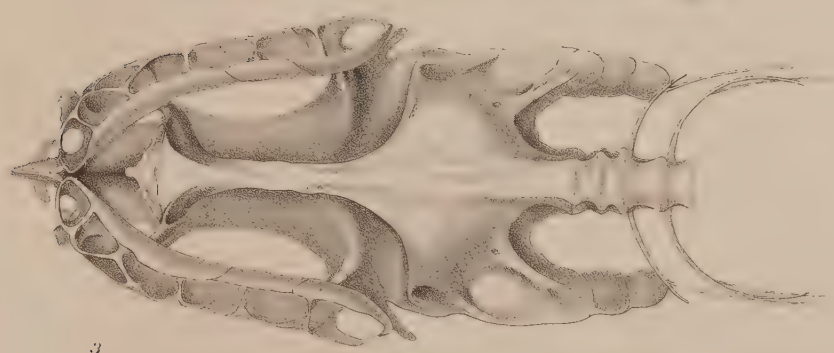


2.



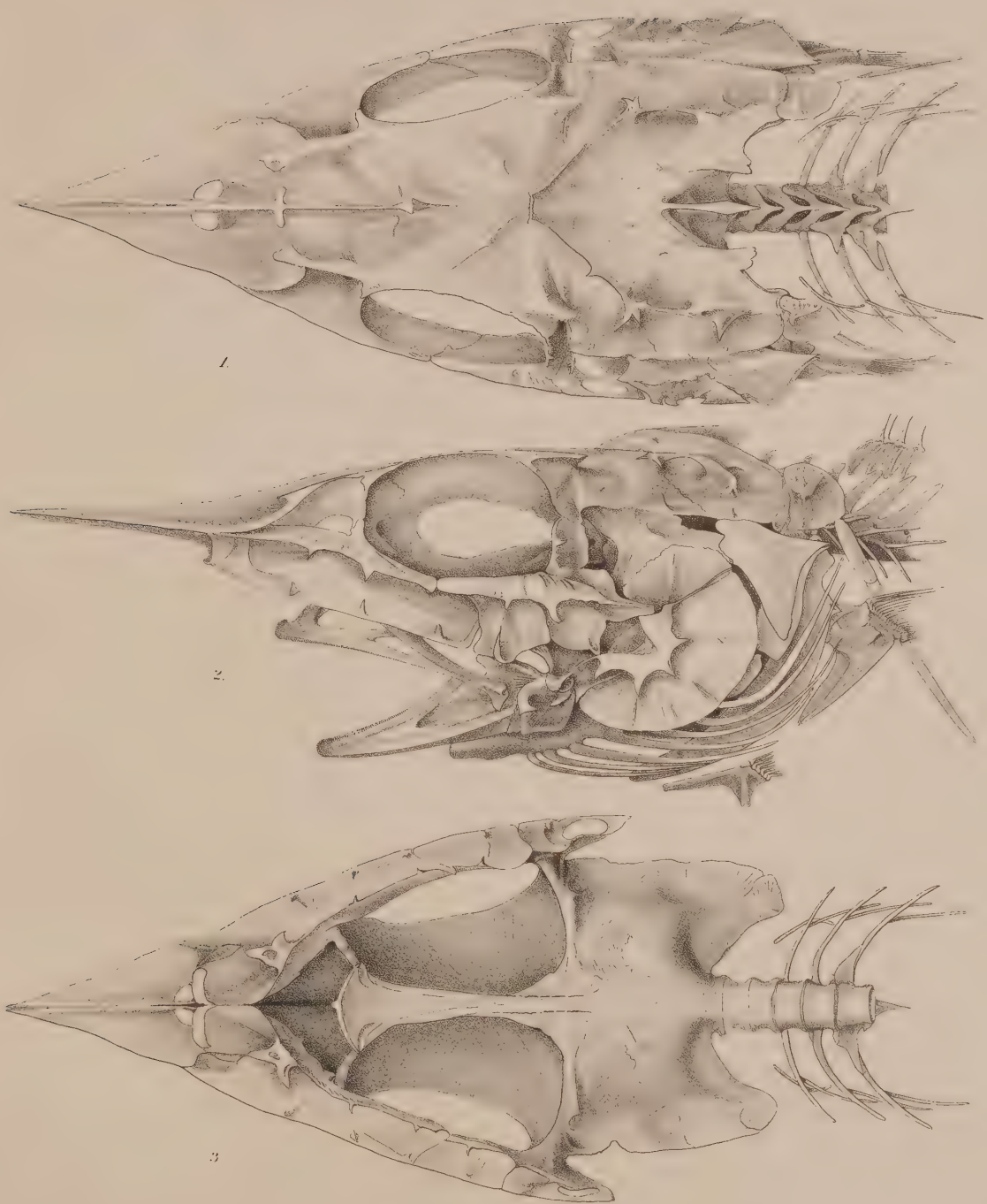
3

J. Henry Blake, del.

B. Meisel, lith.

PLATE LI.

TRACHYRHYNCHUS HELOLEPIS Gilb. Page 218.



J. Henry Blake, del. B. Meisel, lith.

PLATE LII.

Figs. 1–2. Monolene maculipinna Garm. Page 226.

Fig. 3. Symphurus microlepis Garm. Page 230.

1.

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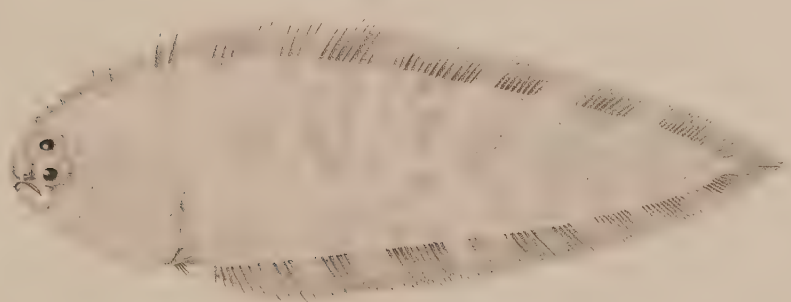

J. Henry Blake, del. B. Meisel lith.

PLATE LIII.

Fig. 1. Sternoptyx obscura Garm. Page 232.

Fig. 2. Valenciennellus stellatus Garm. Page 239.

Fig. 3. Maurolicus oculatus Garm. Page 241.

Figs. 4–4ª. Lychnopoles argenteolus Garm. Page 244.

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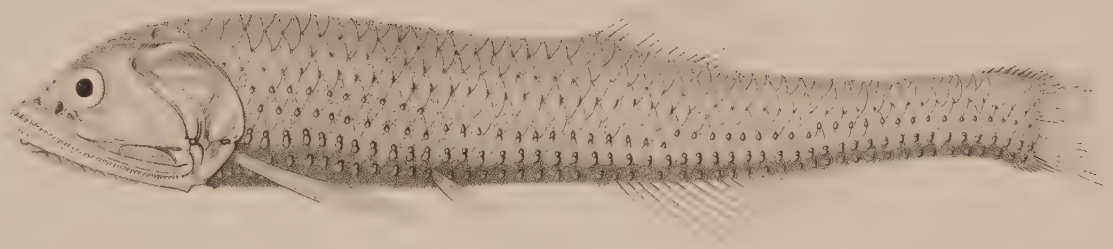

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PLATE LIV.

Figs. 1–1^{e}. Chlorophthalmus mento Garm. Page 253.

Figs. 2–2^{d}. Scopelengys dispar Garm. Page 254.

J Henry Blake, del

B Meisel lith.

PLATE LV.

Fig. 1. Bathypteroïs ventralis Garm. Page 256.

Fig. 2. Myctophum luminosum Garm. Page 263.

Fig. 3. Myctophum aurolaternatum Garm. Page 264.

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PLATE LVI.

Fig. 1. Myctophum laternatum Garm. Page 267.

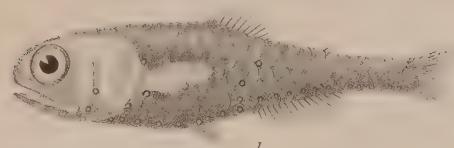
Fig. 2. Myctophum oculeum Garm. Page 260.

Fig. 3. Myctophum nitidulum Garm. Page 266.

Fig. 4. Stomias atriventer Garm. Page 277.

Fig. 5. Stomias hexagonatus Garm. Page 276.

Fig. 6. Dactylostomias filifer Garm. Page 279.



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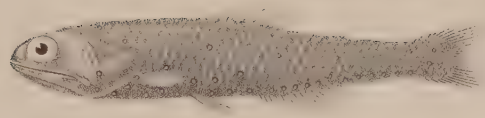

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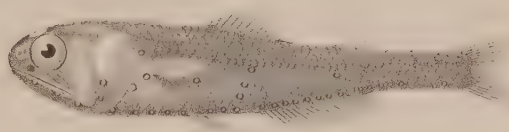

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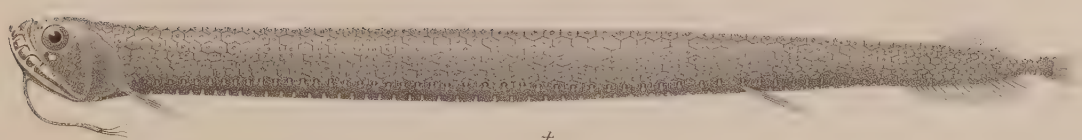

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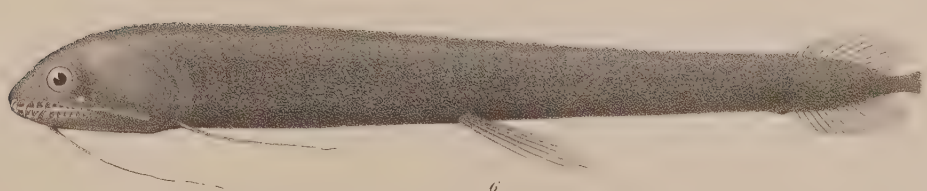

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J Henry Blake, del.

B Meisel lith.

PLATE LVII.

Fig. 1. Stomias colubrinus Garm. Page 275.

Fig. 2. Alepocephalus fundulus Garm. Page 293.

Fig. 3. Narcetes pluriserialis Garm. Page 289.

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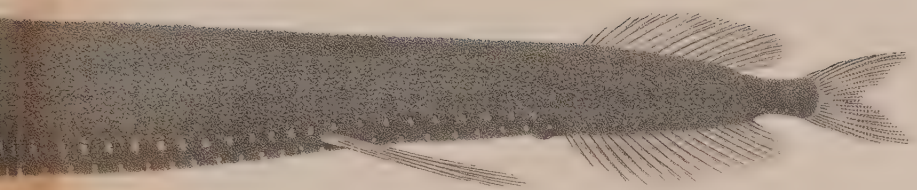

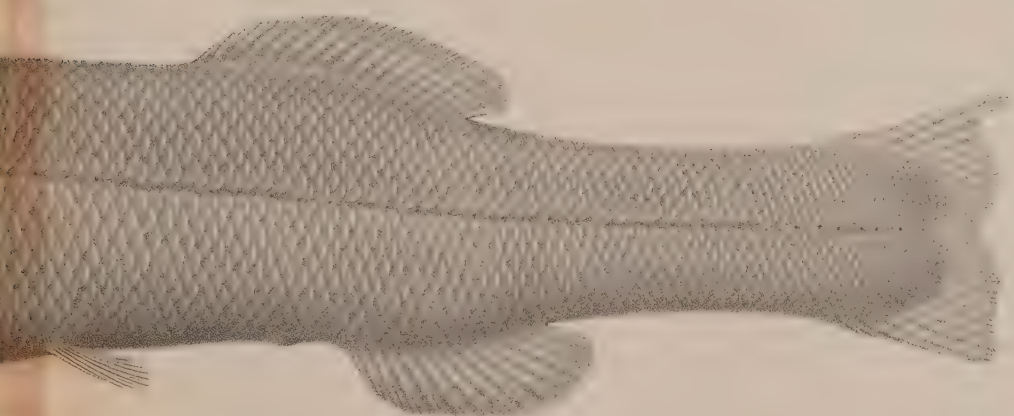

B. Meisel, lith.

PLATE LVIII.

Fig. 1. Bathytroctes alveatus Garm. Page 287.

Fig. 2. Bathytroctes alvifrons Garm. Page 286.

Fig. 3. Leptochilichthys Agassizii Garm. Page 285.

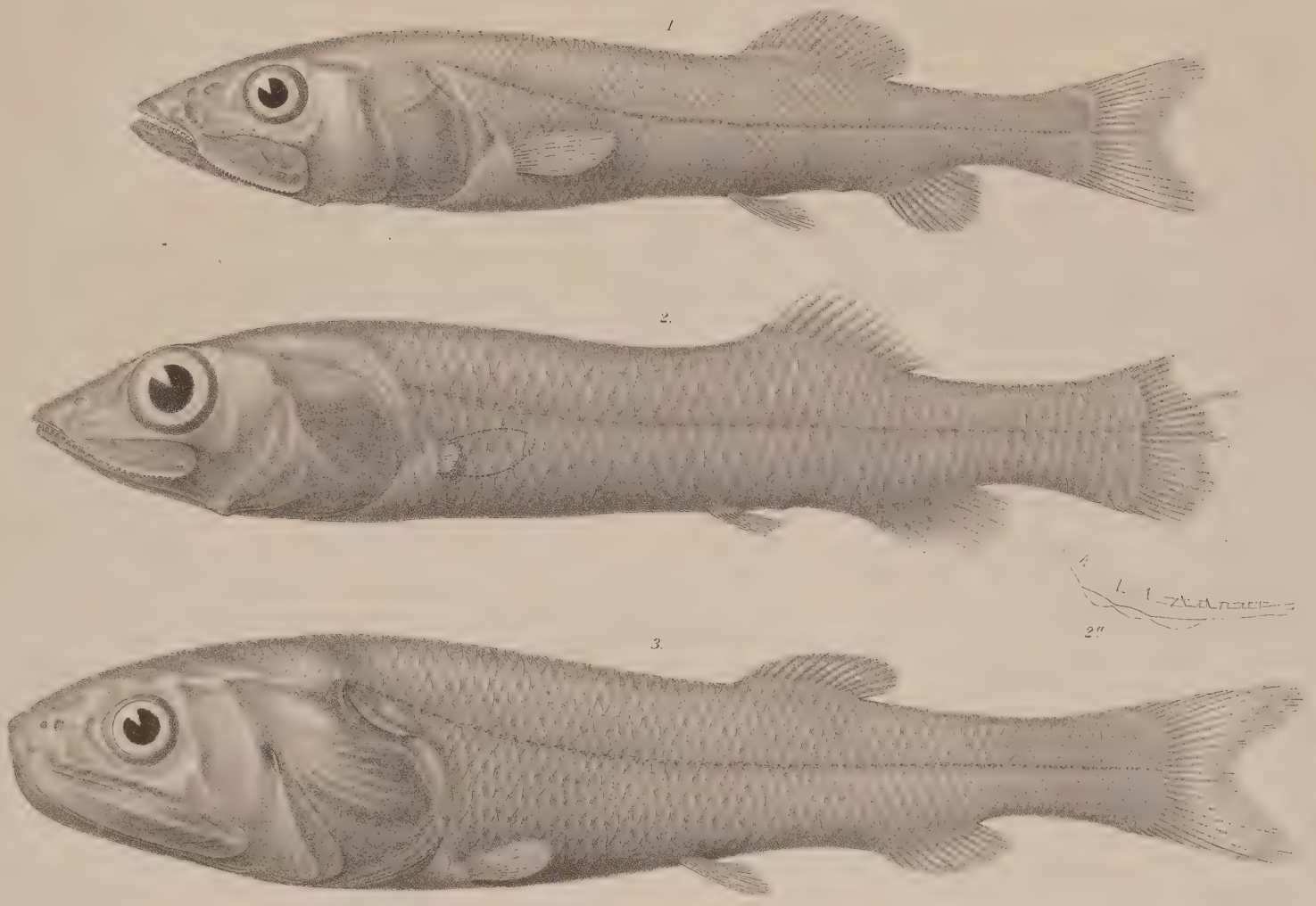

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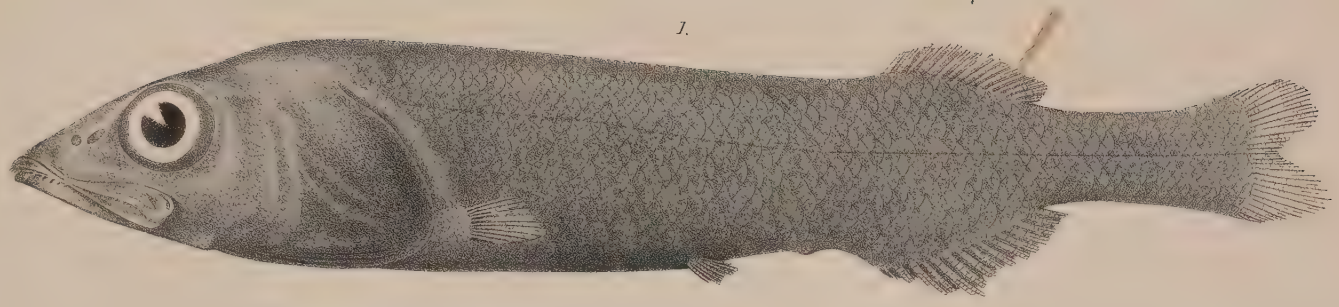
PLATE LIX.

Fig. 1. ALEPOCEPHALUS ASPERIFRONS Garm. Page 291.

Fig. 2. ALEPOCEPHALUS CONVEXIFRONS Garm. Page 292.

1.



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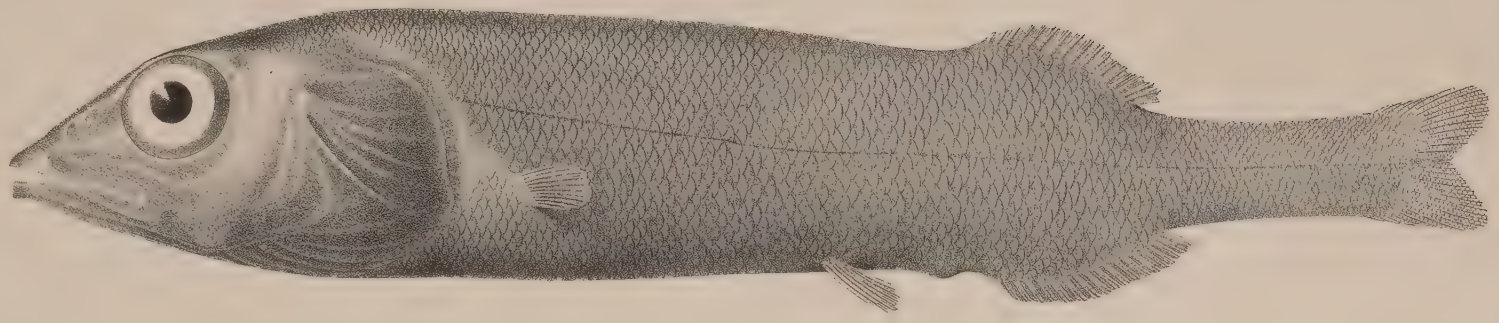

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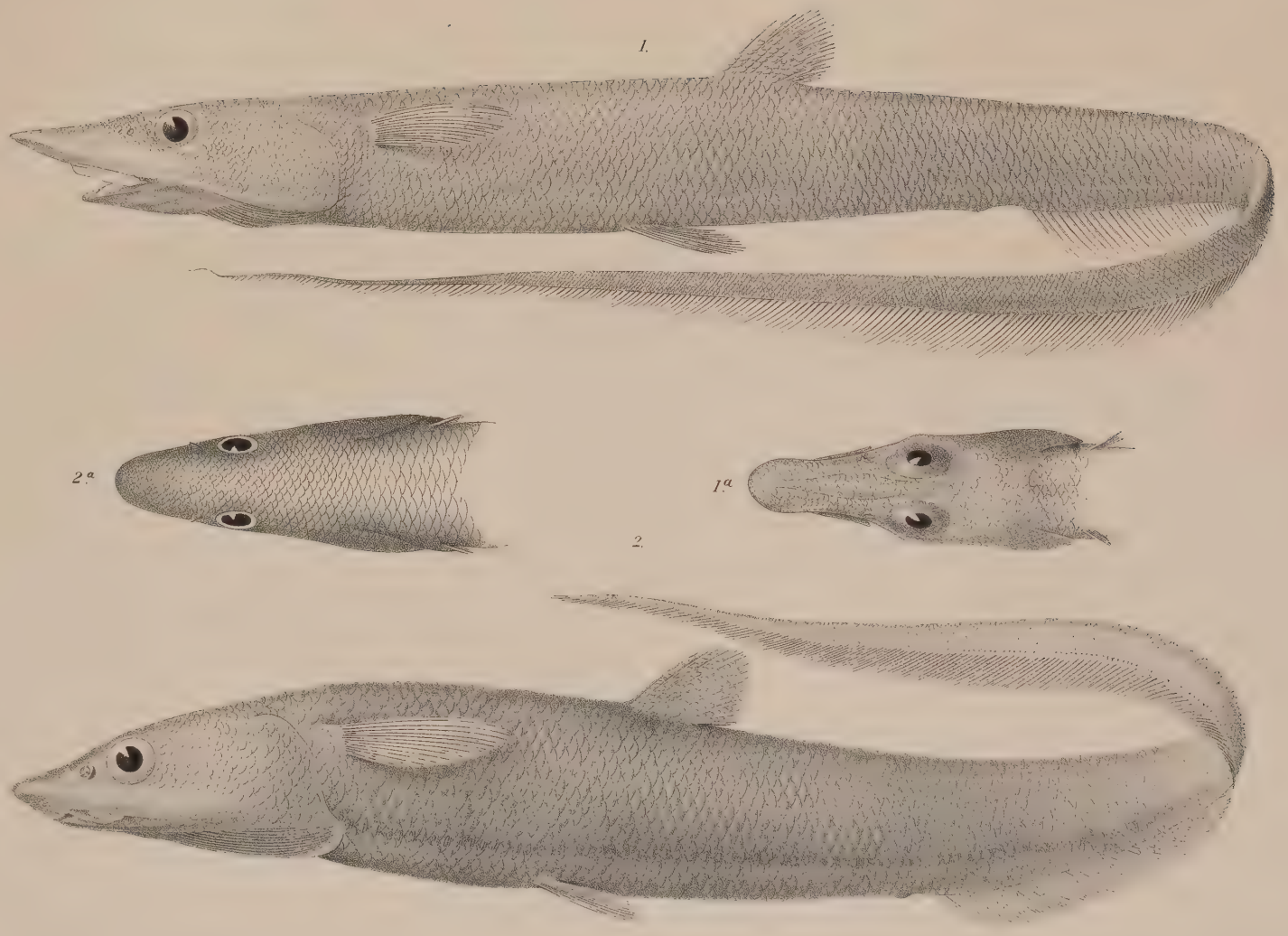
PLATE LX.

Figs. 1–1ª. HALOSAURUS ATTENUATUS Garm. Page 296.

Figs. 2, 2ª. HALOSAURUS RADIATUS Garm. Page 298.



J. Henry Blake, del.

B Meisel, lith.

PLATE LXI.

Figs. 1–1ª. Uroconger varidens Garm. Page 304.

Fig. 2. Venefica ocella Garm. Page 318.

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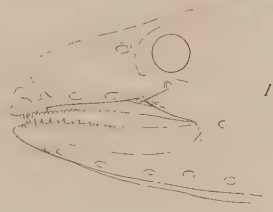

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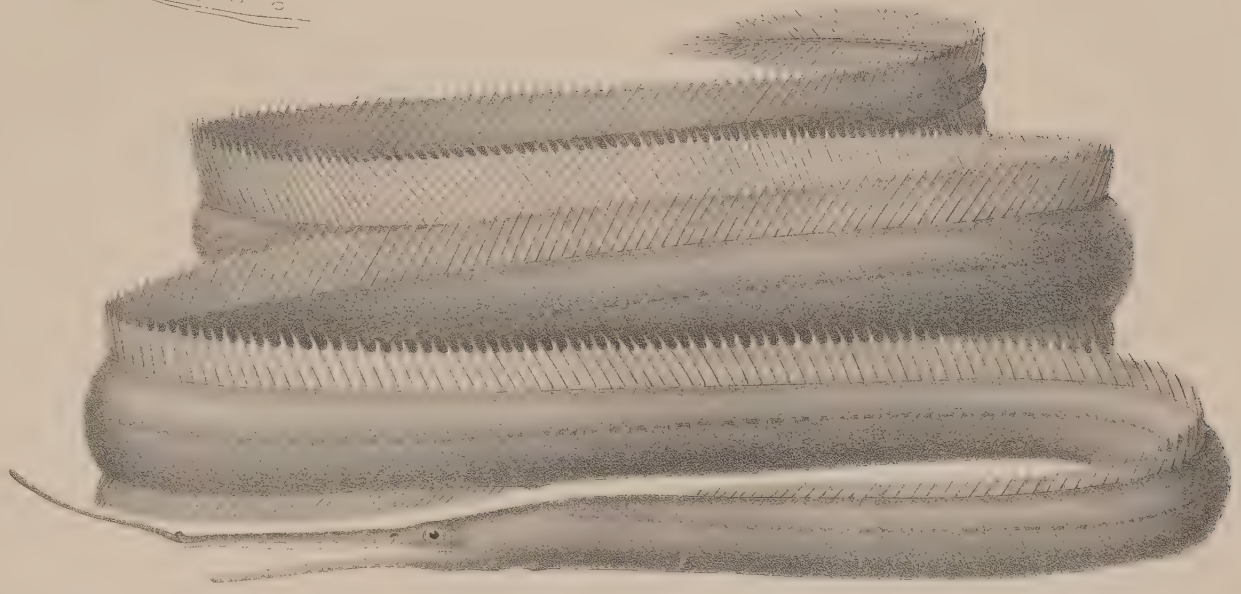

J. Henry Blake, del.

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PLATE LXII.

Fig. 1. Congrosoma Evermanni Garm. Page 308.

Fig. 2. Chlopsis Gilbertii Garm. Page 316.

1.

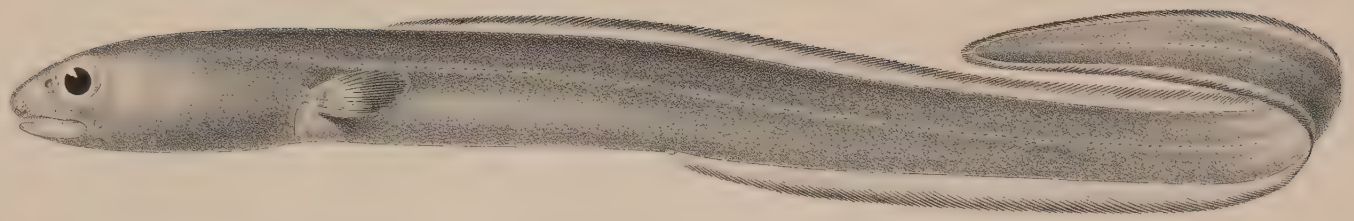

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PLATE LXIII.

SERRIVOMER SECTOR Garm. Page 320.

Fig. 1. Entire figure, natural size.

Figs. 2–3. Skull to pectoral fins, from top and side, enlarged.

Fig. 4. Hyals and branchiostegal rays, twice natural length.

Fig. 5. Branchial skeleton from above, twice natural length.

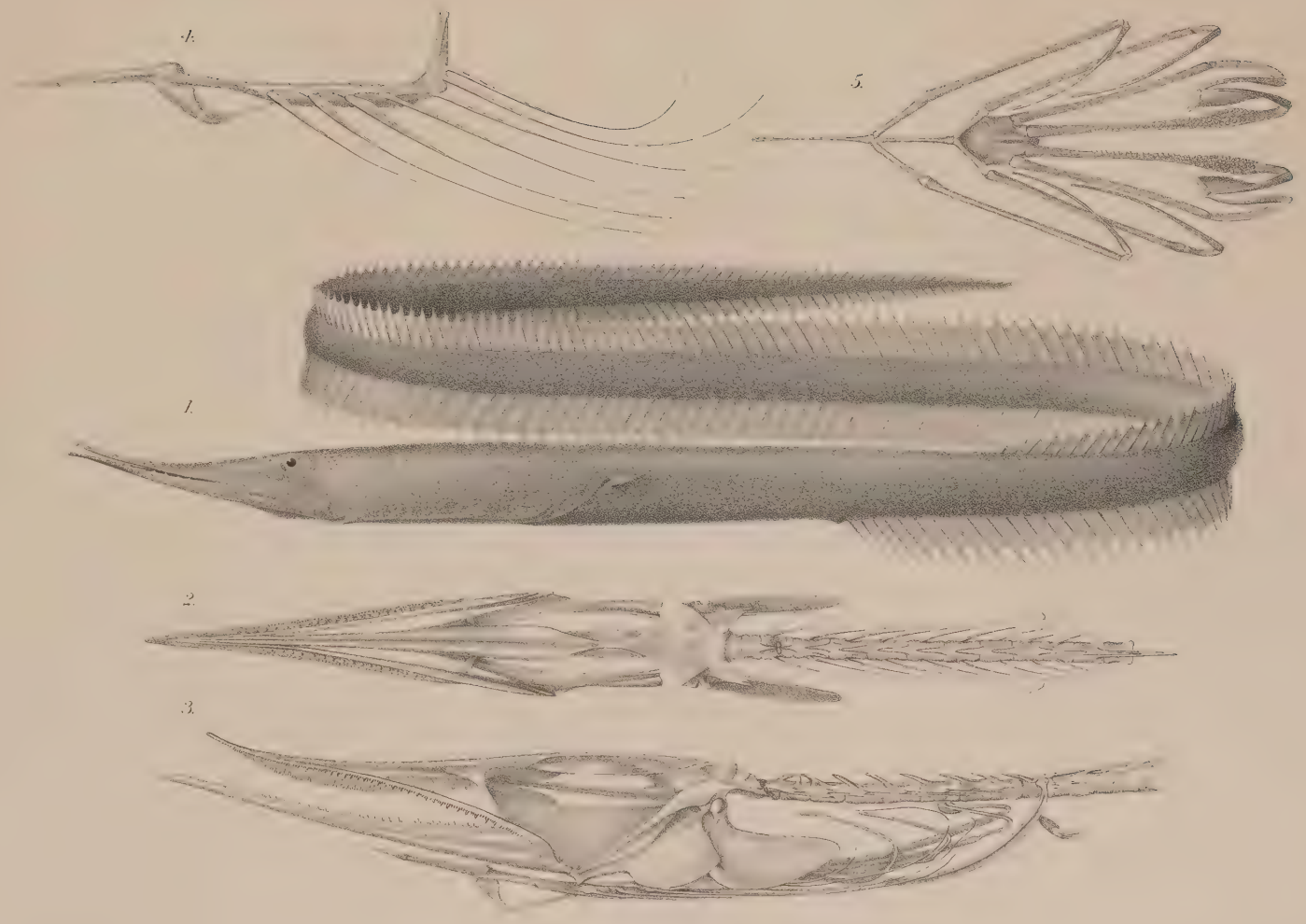

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PLATE LXIV.

Fig. 1. LABICHTHYS BOWERSII Garm. Page 323.

Fig. 2. CALLORHYNCHUS CALLORHYNCHUS Linn. Egg case. Page 21.

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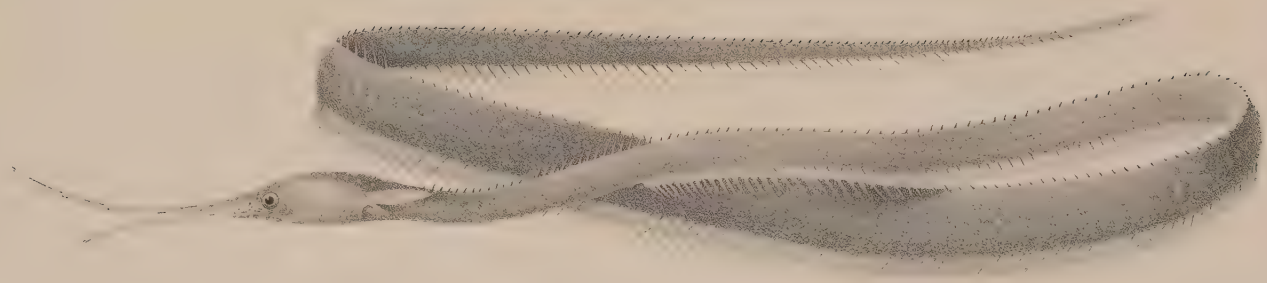

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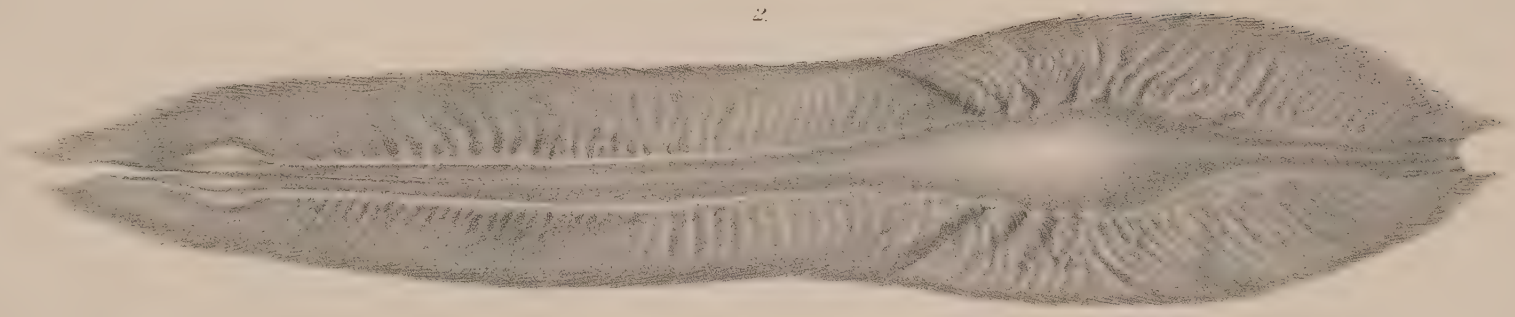

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PLATE LXV.

Fig. 1. NEMICHTHYS FRONTO Garm. Page 324.

Fig. 2. ATOPICHTHYS ESUNCULUS Garm. Page 327.

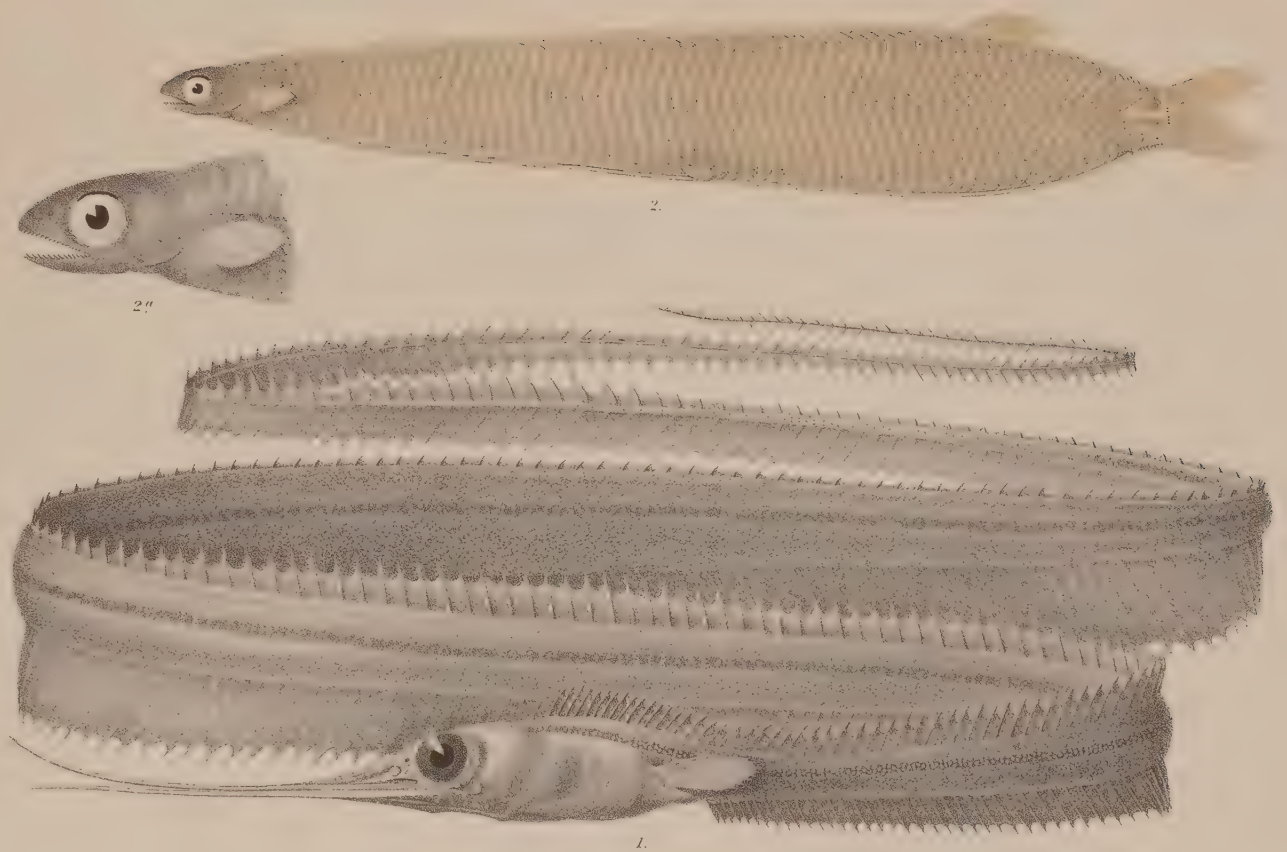

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PLATE LXVI.

Figs. 1–1[b]. ATOPICHTHYS SICARIUS Garm. Page 328.

Figs. 2–2[a]. ATOPICHTHYS CINCTUS Garm. Page 329.

Figs. 3–3[a]. ATOPICHTHYS DENTATUS Garm. Page 330.

Figs. 4–4[a]. ATOPICHTHYS FALCIDENS Garm. Page 331.

Figs. 5–5[a]. ATOPICHTHYS ACUS Garm. Page 332.

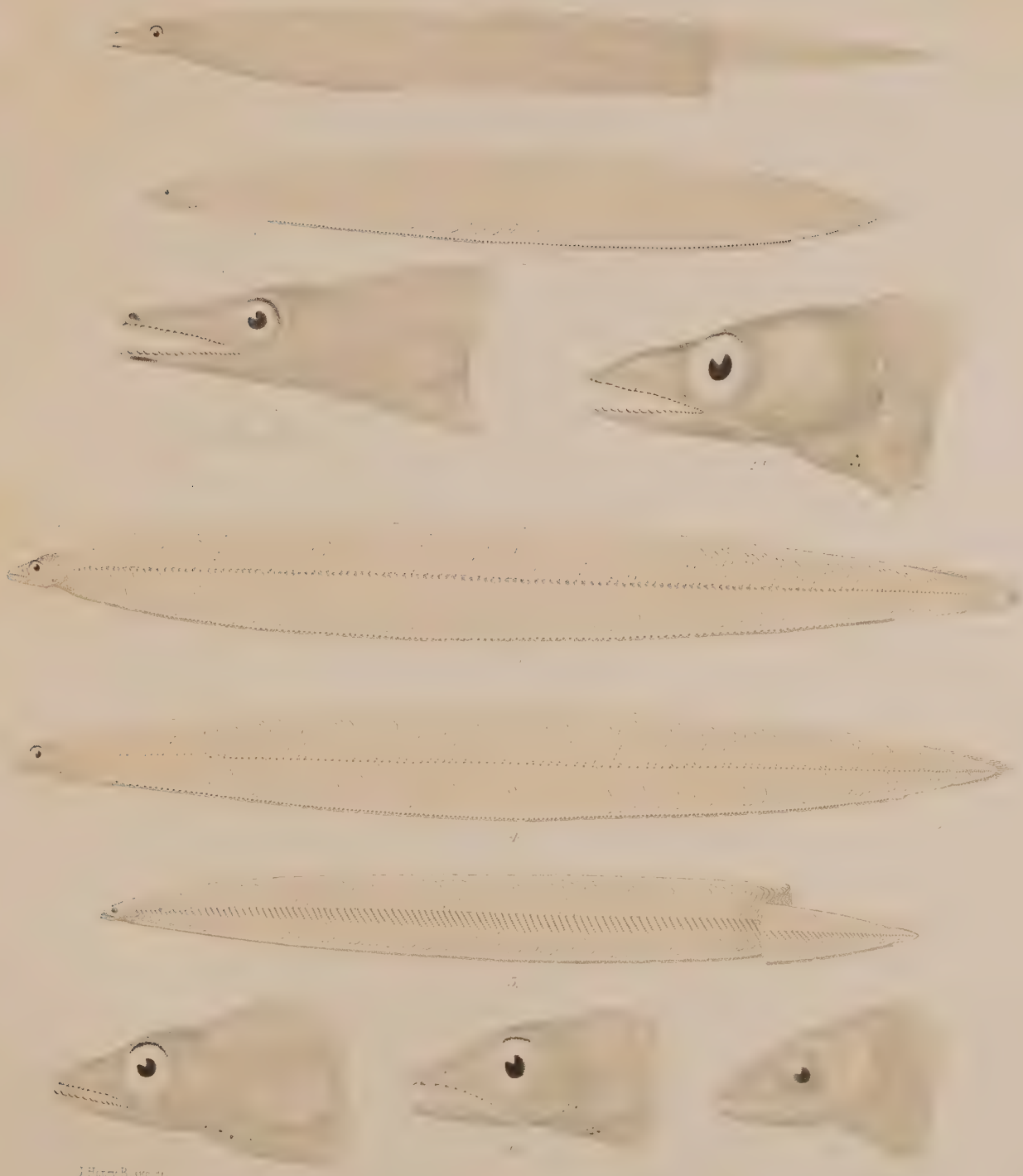

PLATE LXVII.

Figs. 1–1ª. Atopichthys ophichthys Garm. Pages 333.

Figs. 2–2ª. Atopichthys cingulus Garm. Pages 334.

Figs. 3–3ª. Atopichthys lychnus Garm. Pages 335.

Figs. 4–4ª. Atopichthys obtusus Garm. Pages 337.

Figs. 5–5ª. Atopichthys longidens Garm. Pages 338.

PLATE LXVIII.

Fig. 1. MYXINE CIRCIFRONS Garm. Page 344.

Fig. 2. Lower view of head of *M. circifrons.*

Fig. 3. Heart and gills of *M. circifrons.*

Fig. 4. Snout, rostrum and barbels of *M. circifrons.*

Fig. 5. Snout, rostrum and barbels of *M. glutinosa* Linn. Page 348.

Fig. 6. Snout, rostrum and barbels of *M. acutifrons* Garm. Page 347.

Fig. 7. Snout, rostrum and barbels of *M. limosa* Gir. Page 346.

Fig. 8. Snout, rostrum and barbels of *M. australis* Jen. Page 345.

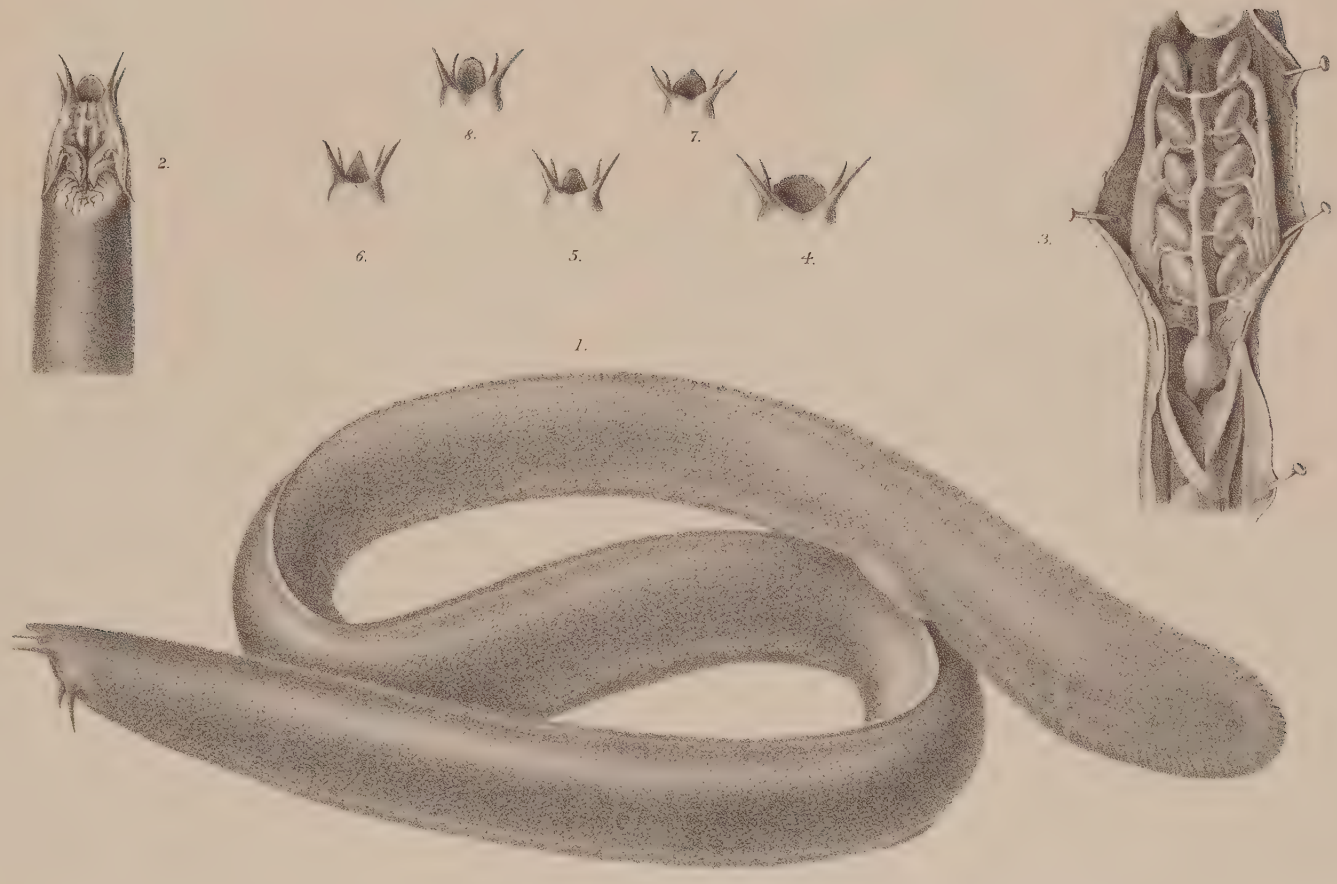

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PLATE LXIX.

Fig. 1. CENTROSCYLLIUM NIGRUM Garm. Pages 28, 352.

Fig. 2. ISISTIUS BRASILIENSIS Q. G. Pages 34, 352.

Fig. 3. Urohyal of *Anthias eos* Gilb. Page 47.

Fig. 4. Urohyal of *Anthias pronotogrammus* Gill.

Fig. 5. Urohyal of *Centristhmus signifer* Garm. Page 48.

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PLATE LXX.

CHLAMYDOSELACHUS ANGUINEUS Garm. Pages 41, 352.

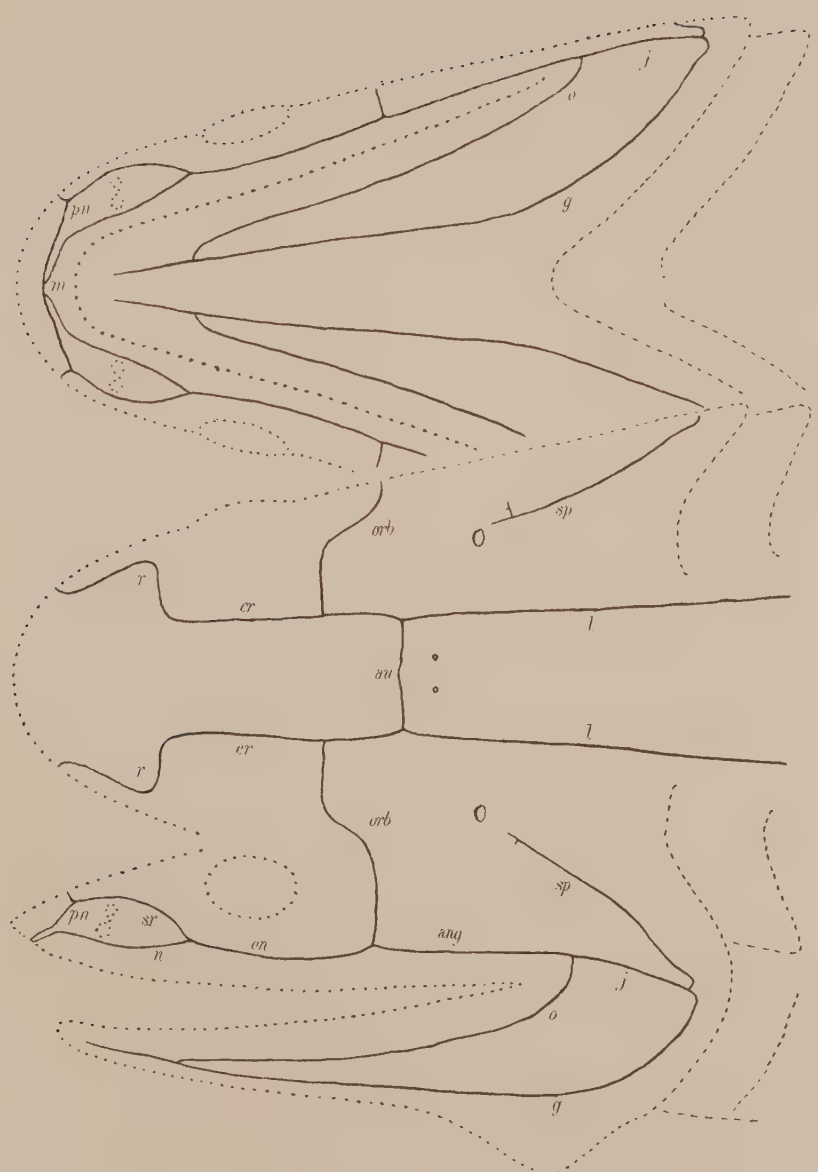
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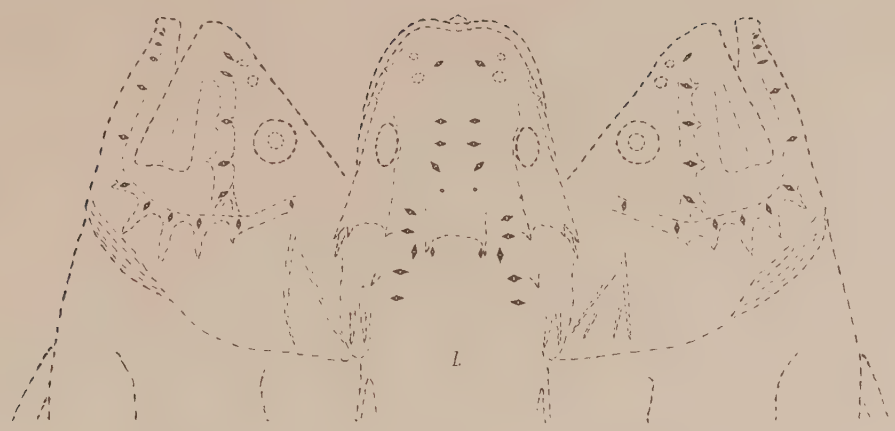
PLATE LXXI.

Fig. 1. Ectreposebastes imus Garm. Pages 53, 360.

Figs. 2–3. Cottunculus Thomsoni Günt. Page 360.

Fig. 4. Hoplostethus pacificus Garm. Pages 56, 360.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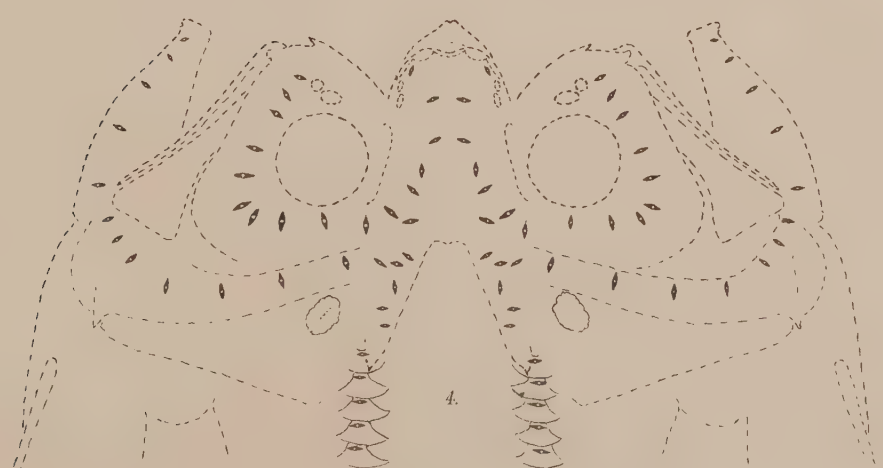
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PLATE LXXII.

Fig. 1. Caulolepis subulidens Garm. Pages 60, 360.

Fig. 2. Melamphaës nigrofulvus Garm. Pages 64, 360.

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PLATE LXXIII.

Figs. 1–2. Chaunax coloratus Garm. Pages 83, 360.

Fig. 3. Lepophidium emmelas Gilb. Pages 142, 360.

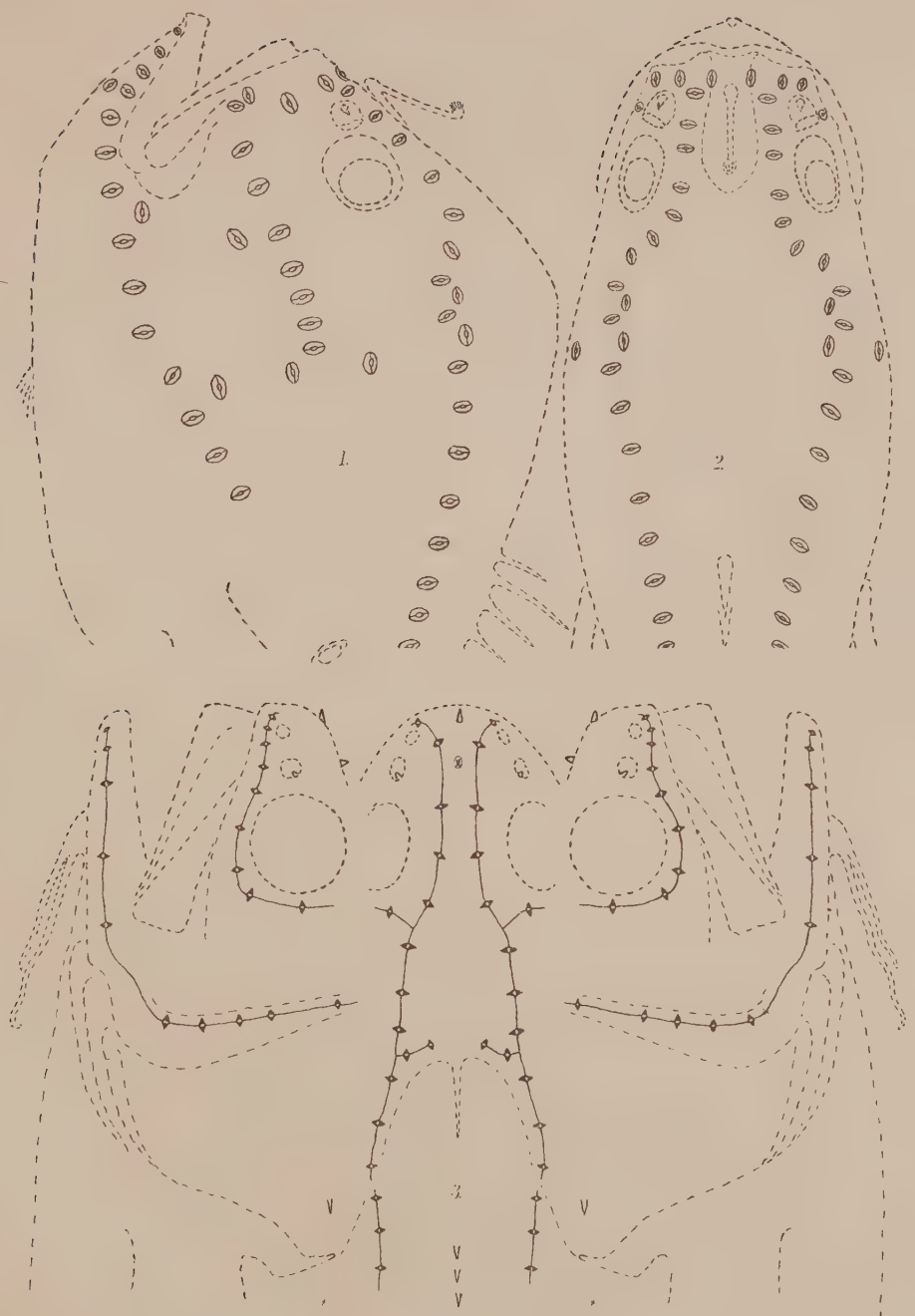
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PLATE LXXIV.

Fig. 1. Leucicorus lusciosus Garm. Pages 146, 361.

Fig. 2. Mixonus caudalis Garm. Pages 148, 361.

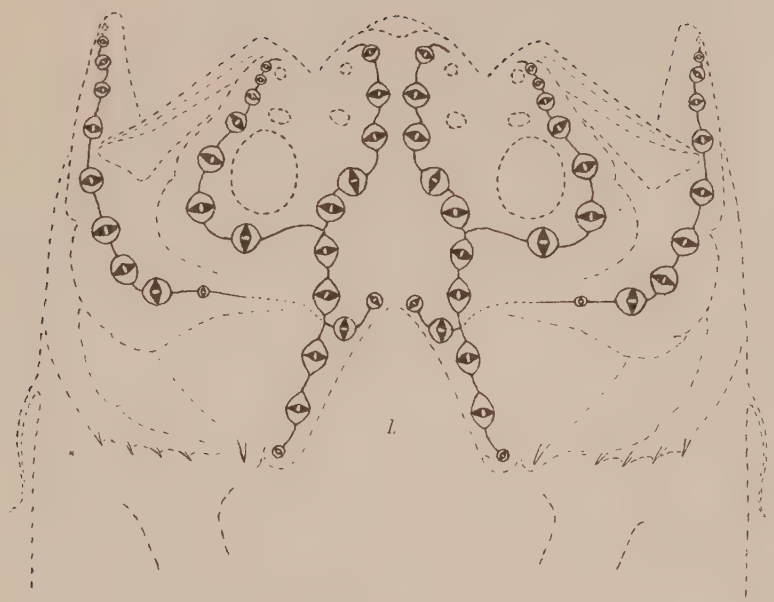

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PLATE LXXV.

Fig. 1. Dicrolene nigra Garm. Pages 150, 361.

Fig. 2. Dicrolene filamentosa Garm. Pages 149, 361.

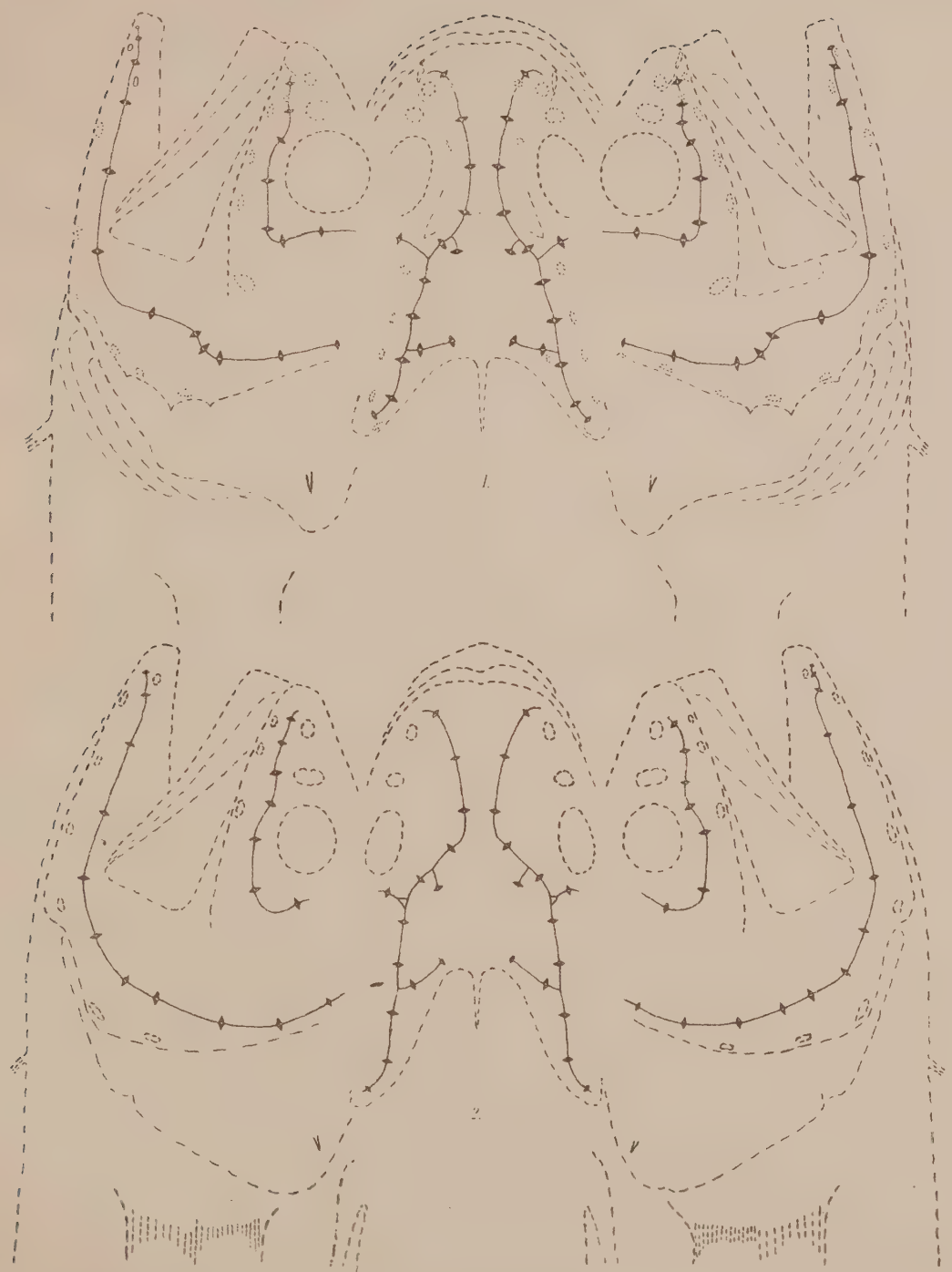

PLATE LXXVI.

Fig. 1. Porogadus longiceps Garm. Pages 153, 361.

Fig. 2. Holcomycteronus digittatus Garm. Pages 163, 361.

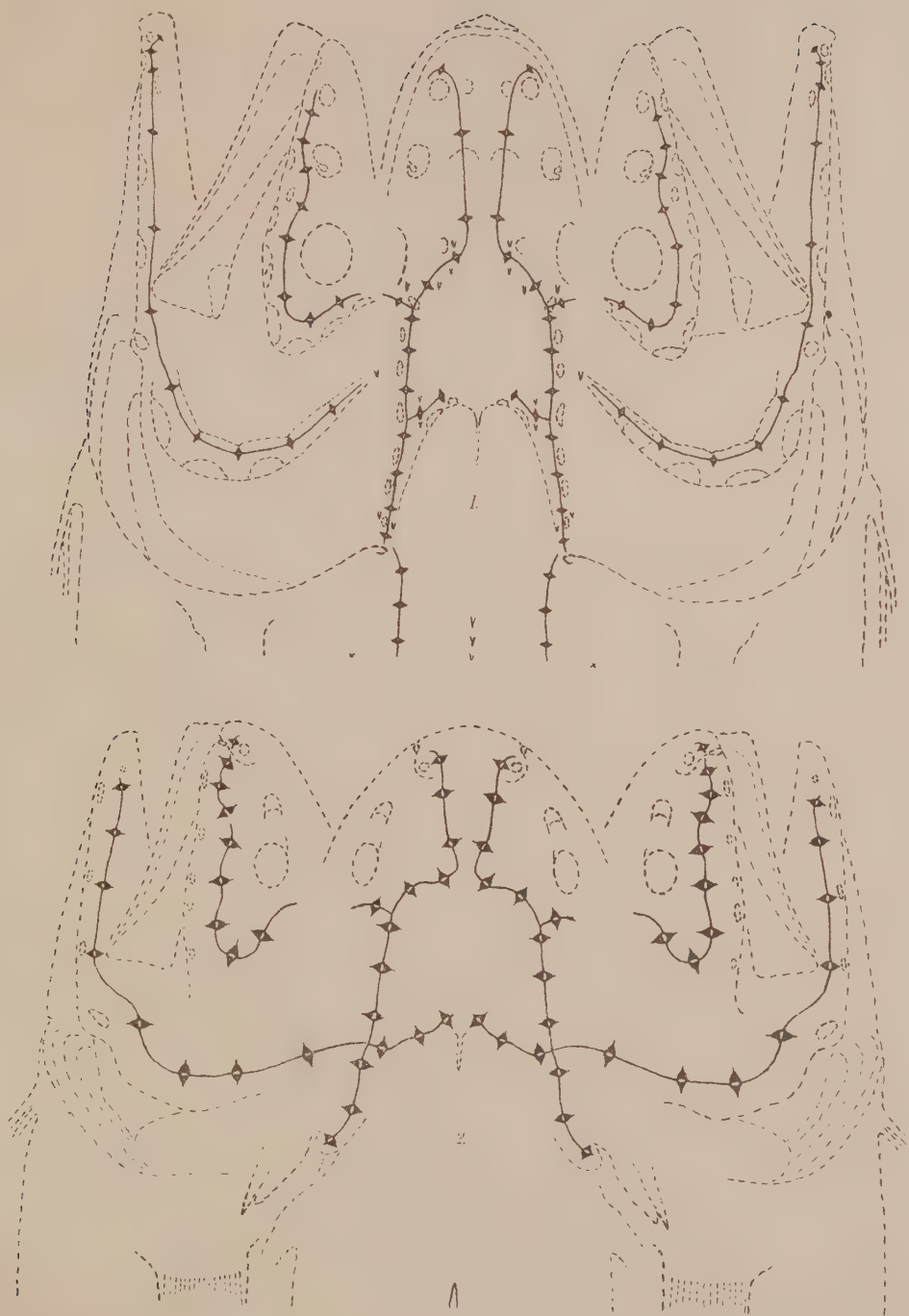

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PLATE LXXVII.

Bassozetus nasus Garm. Pages 159, 361.

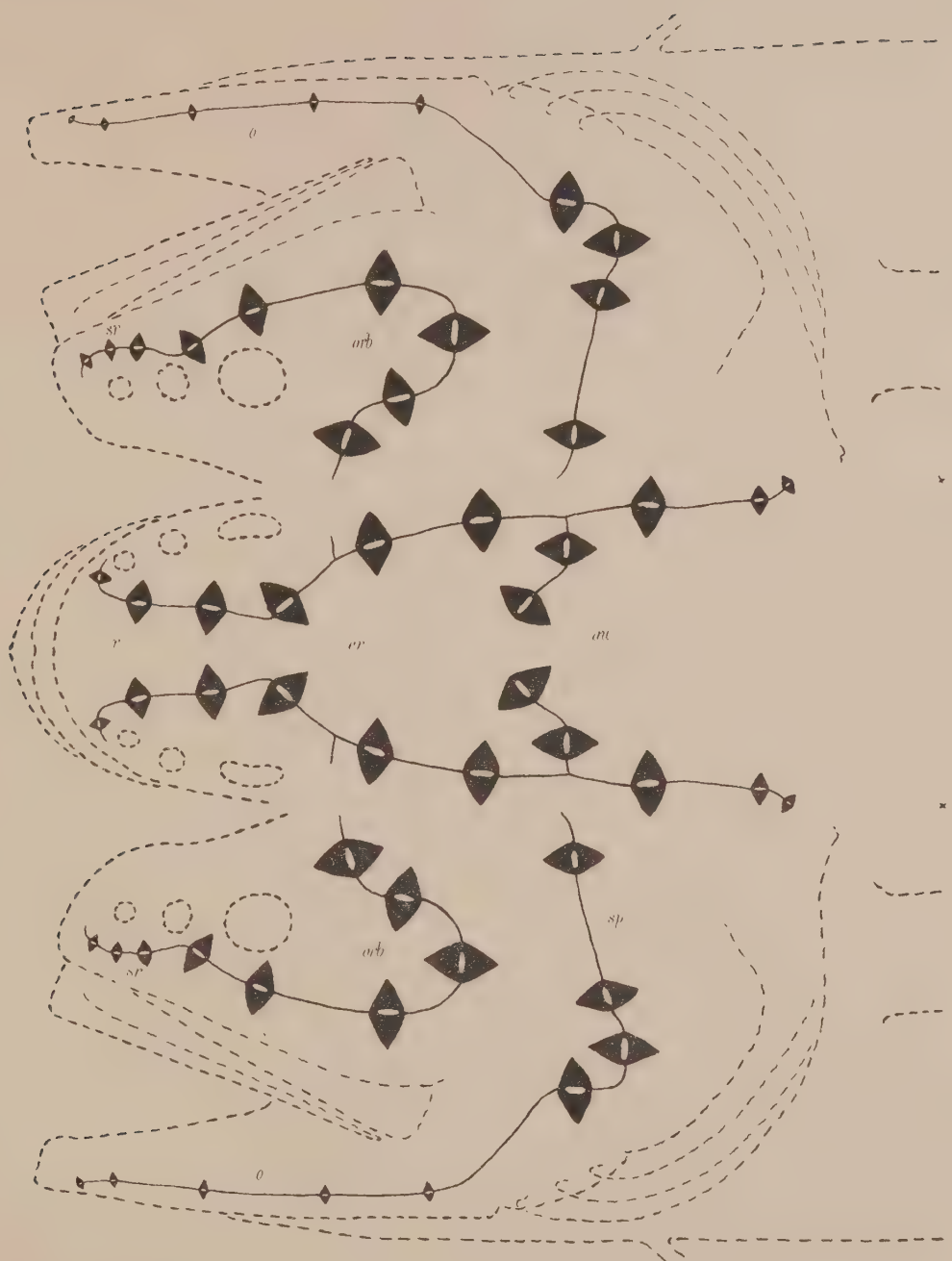
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PLATE LXXVIII.

Bassozetus nasus Garm. Pages 159, 361.

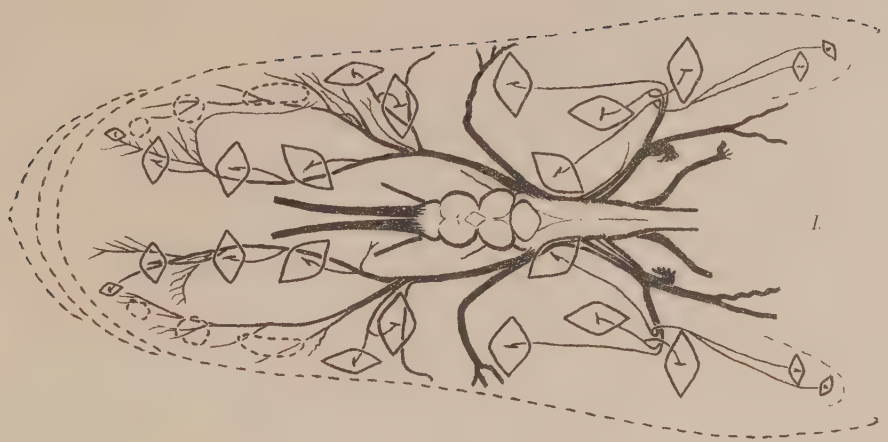

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PLATE LXXIX.

Fig. 1. ERETMICHTHYS OCELLA Garm. Pages 166, 362.

Fig. 2. ERETMICHTHYS PINNATUS Garm. Pages 165, 362.

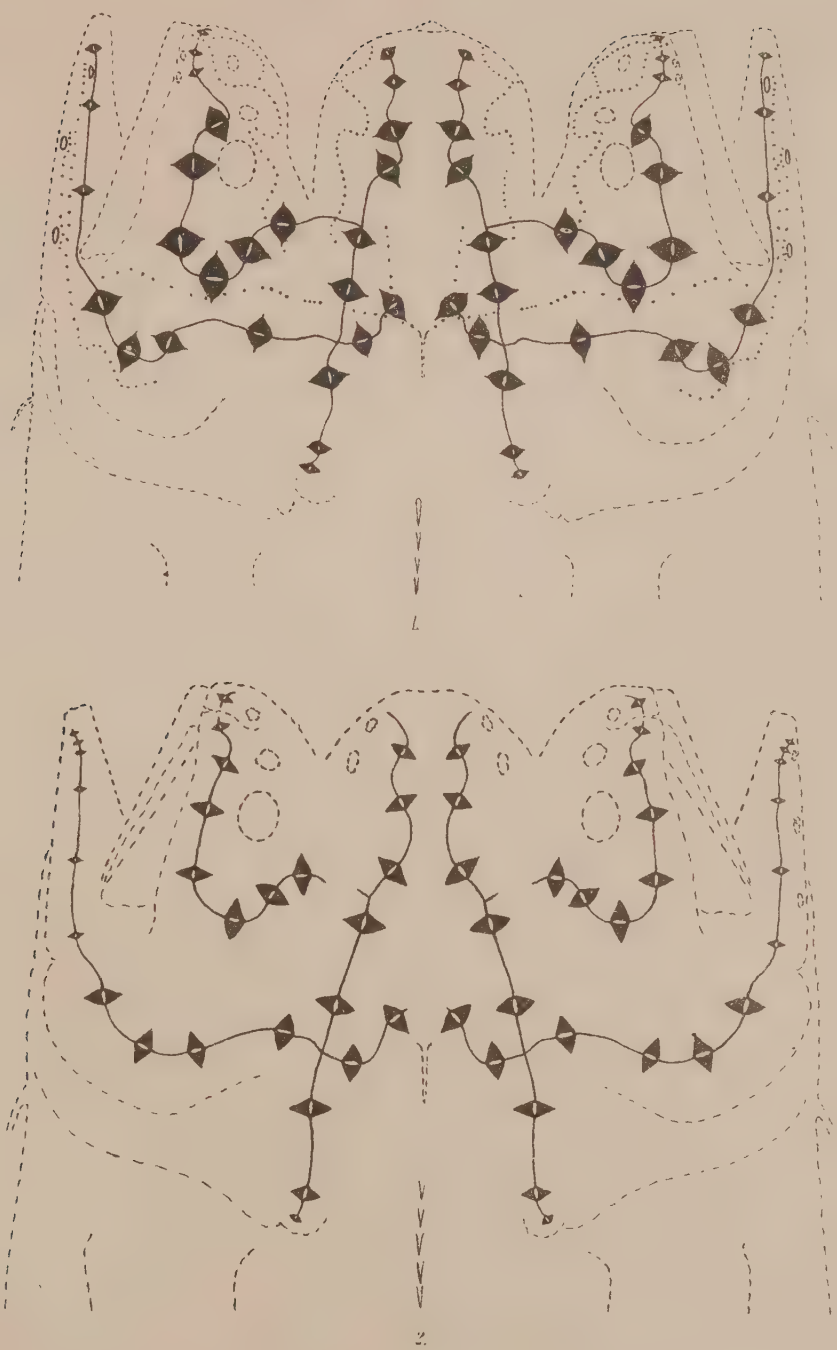

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PLATE LXXX.

Fig. 1. Bassogigas stelliferoides Gilb. Pages 161, 362.

Fig. 2. Catætyx simus Garm. Pages 168, 362.

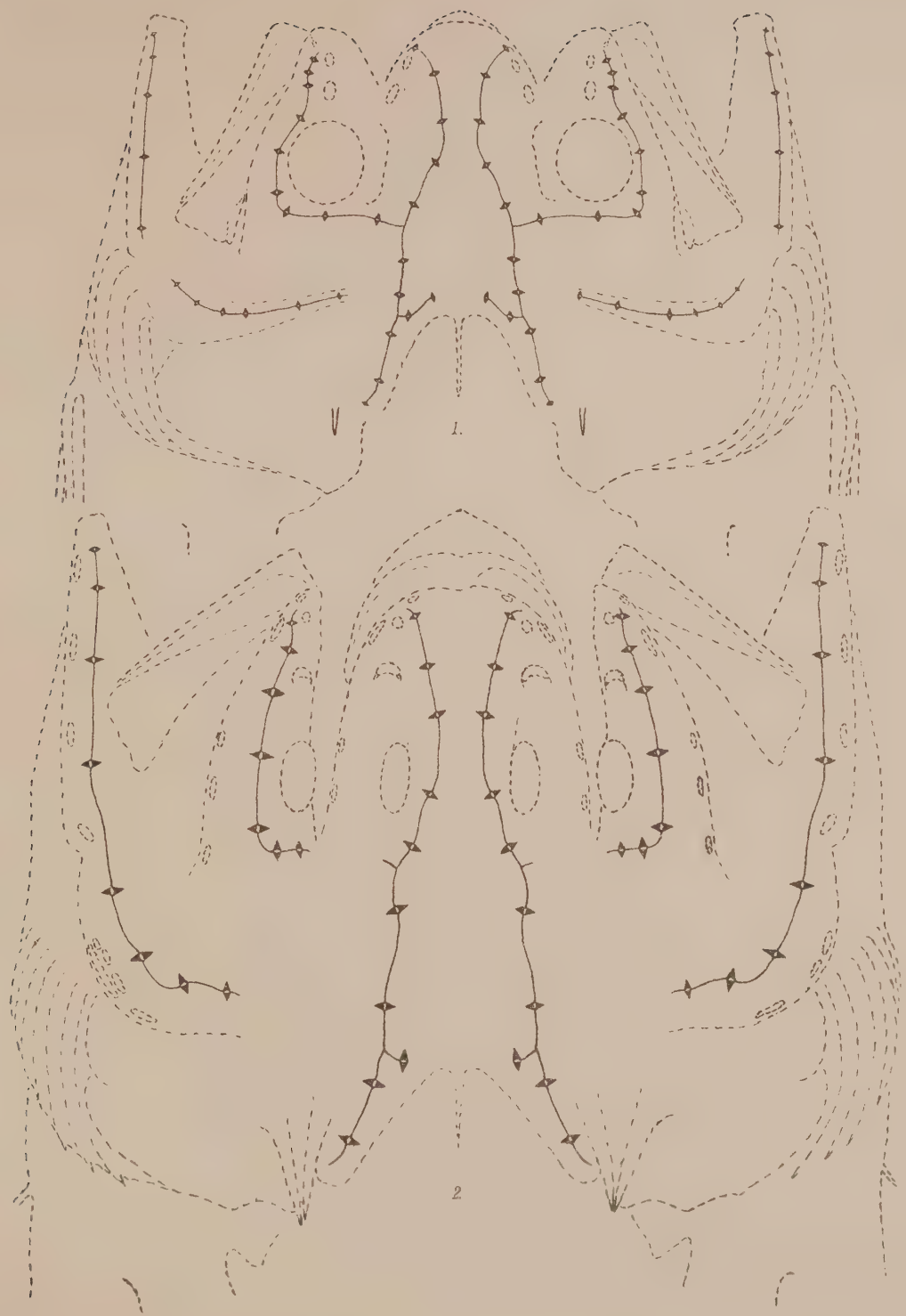

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PLATE LXXXI.

Fig. 1. Lamprogrammus illustris Garm. Pages 174, 362.

Fig. 2. Phycis regius Walb. Page 362.

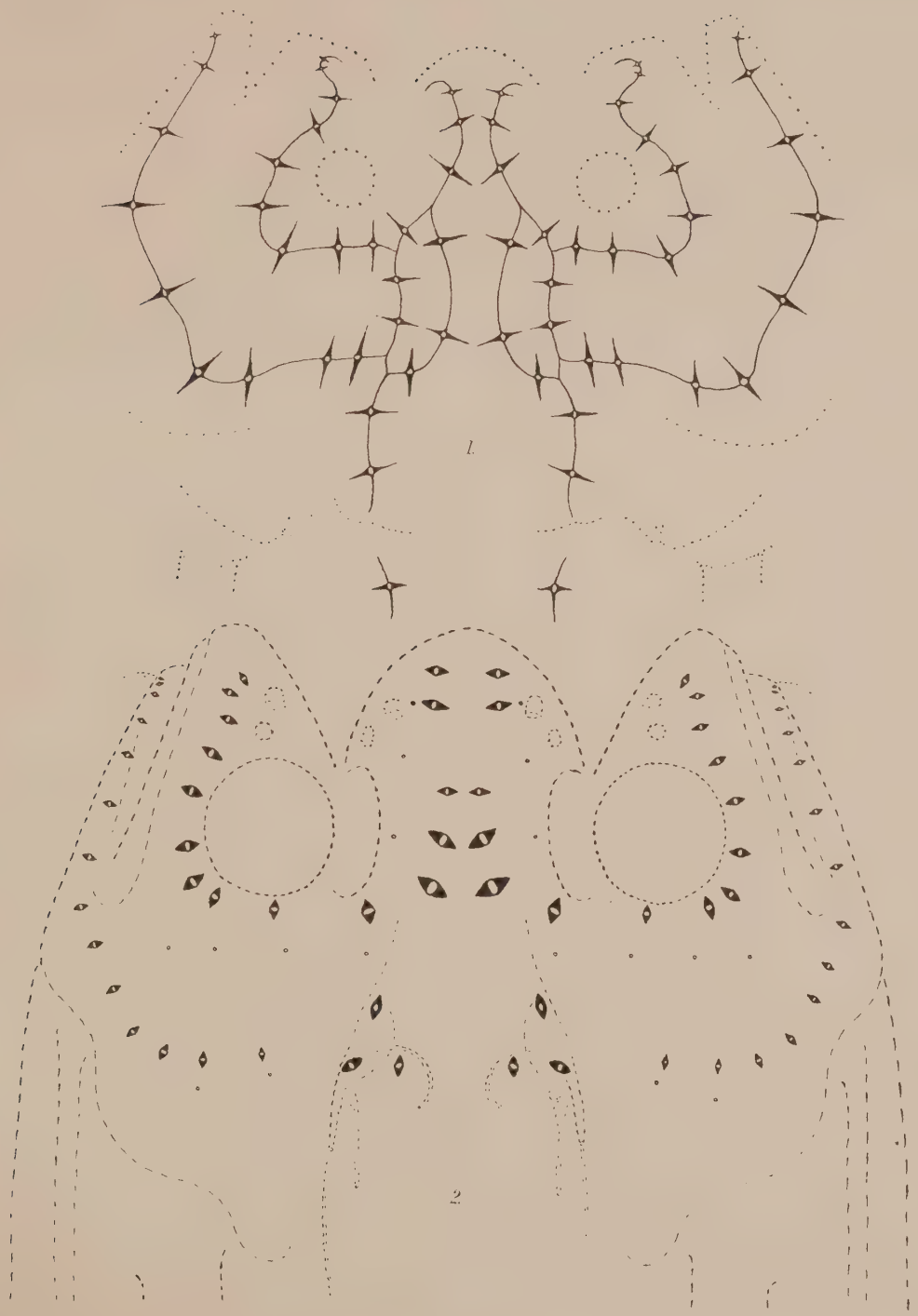

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PLATE LXXXII.

Fig. 1. MERLUCCIUS ANGUSTIMANUS Garm. Pages 183, 363.

Fig. 2. PHYCICULUS RASTRELLIGER Gilb. Pages 189, 363.

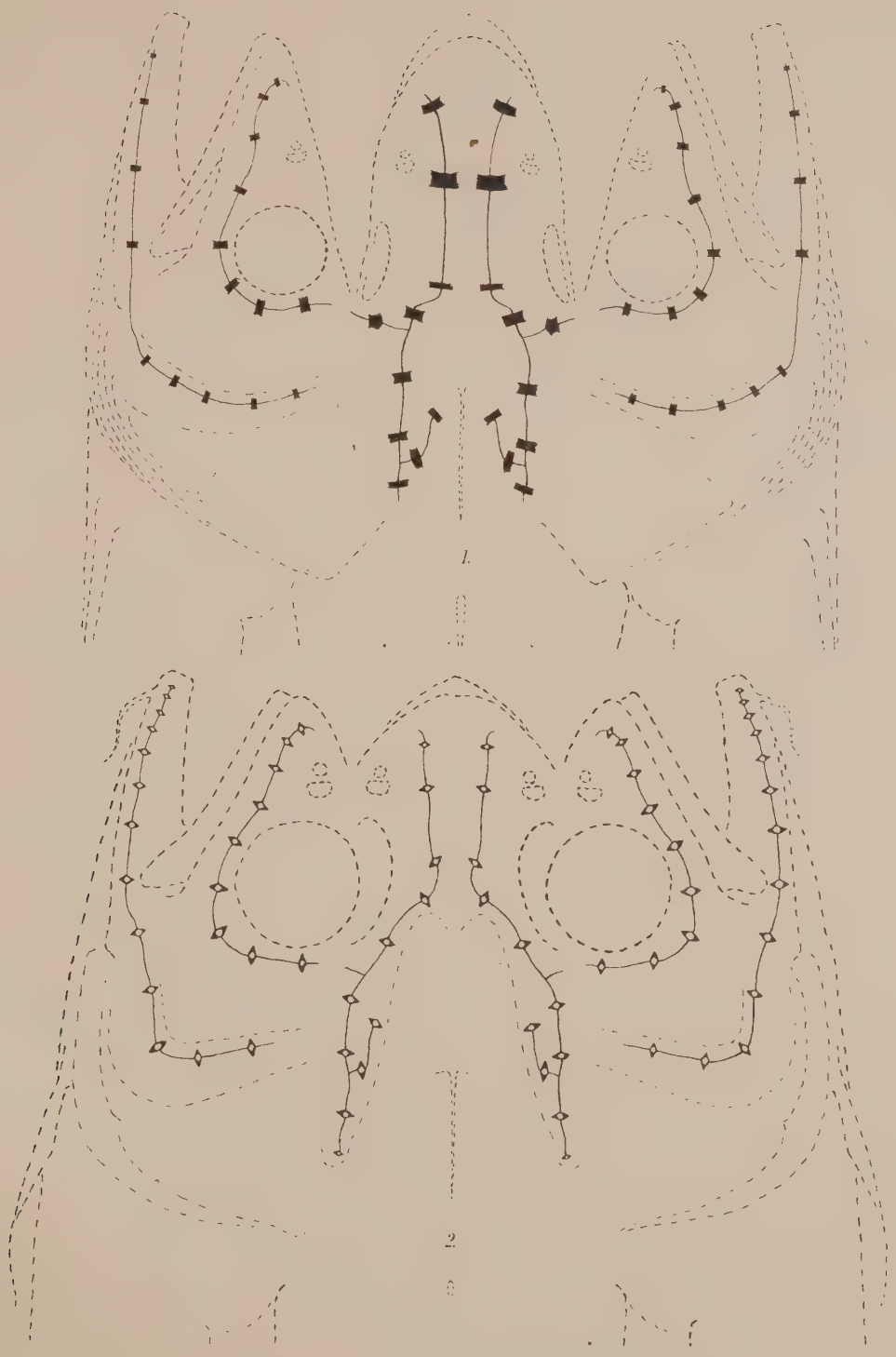
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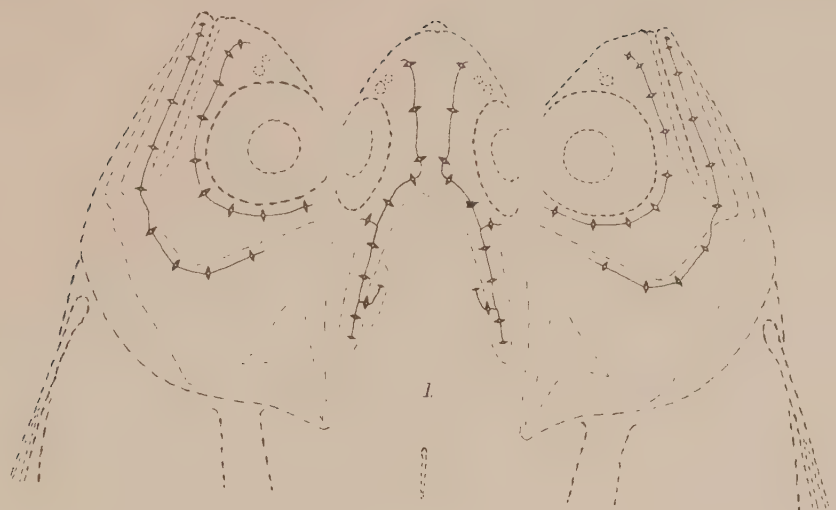
PLATE LXXXIII.

Fig. 1. MICROLEPIDIUM GRANDICEPS Garm. Pages 181, 363.

Fig. 2. MACRURUS ANGULICEPS Garm. Pages 212, 363.



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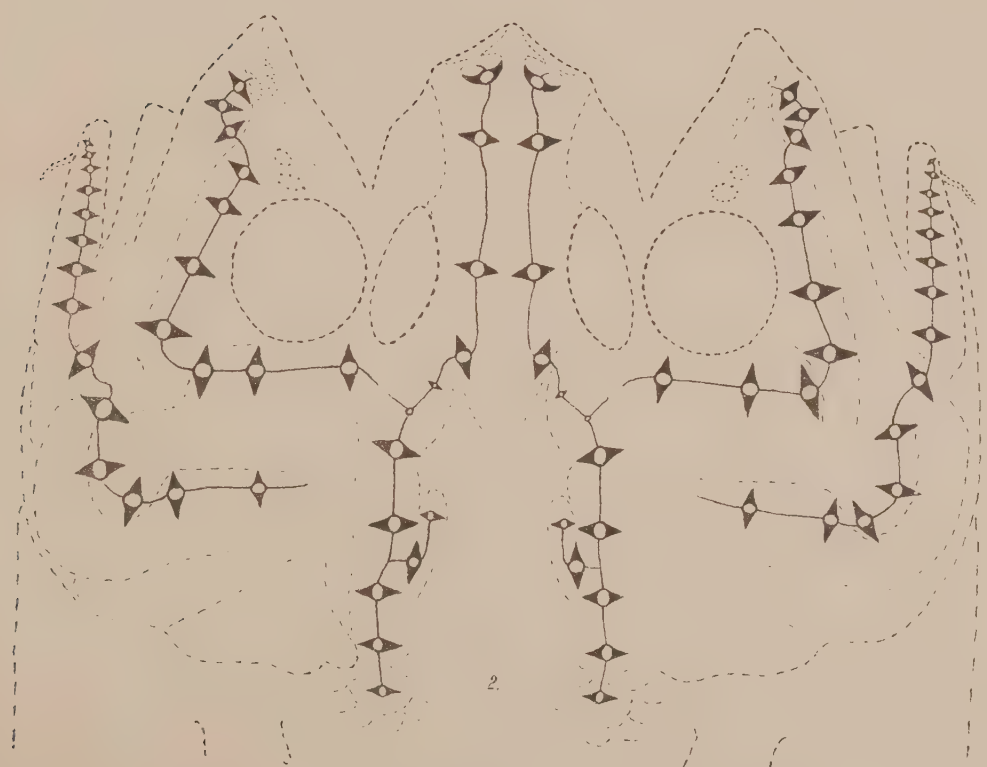

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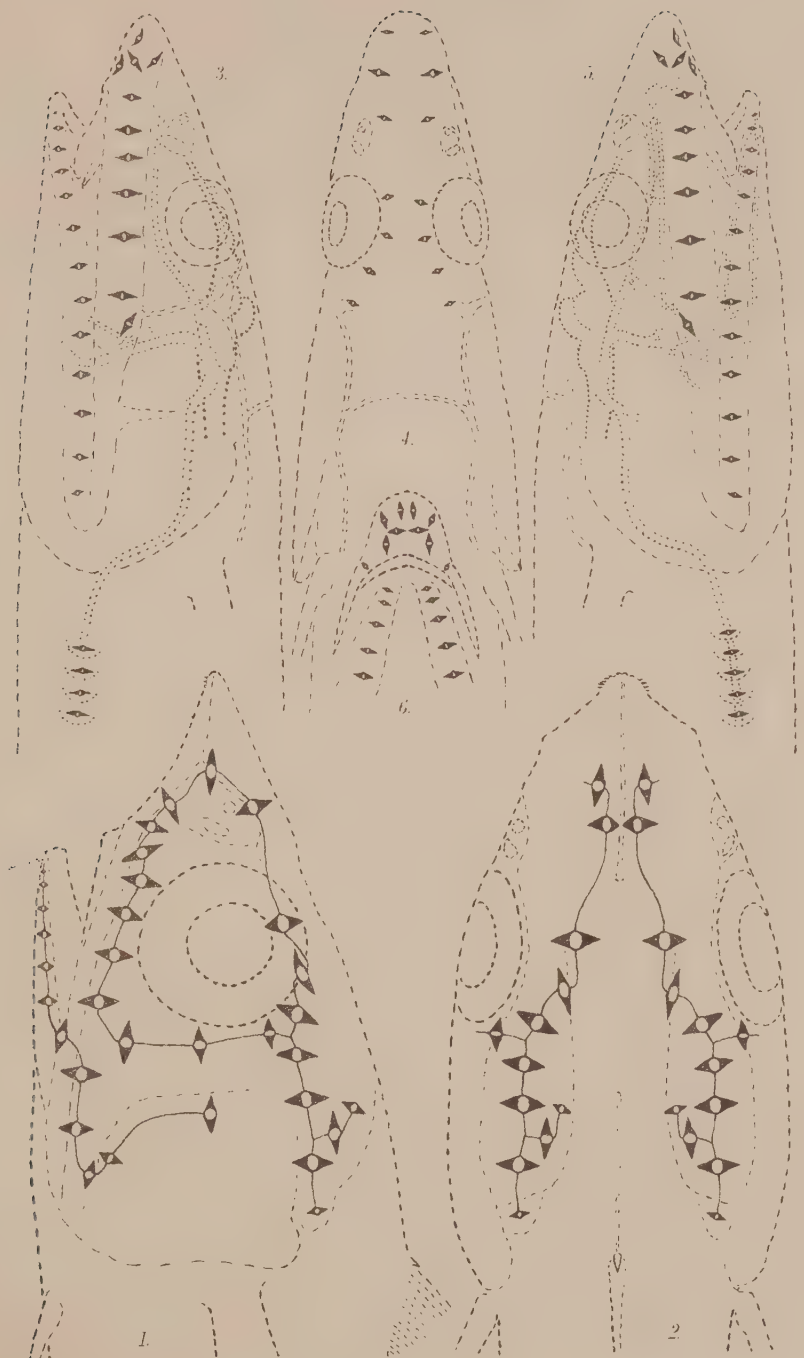
PLATE LXXXIV.

Figs. 1–2. Macrurus canus Garm. Pages 217, 364.

Figs. 3–6. Halosaurus radiatus Garm. Pages 298, 364.


3.
4.
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1.
2.

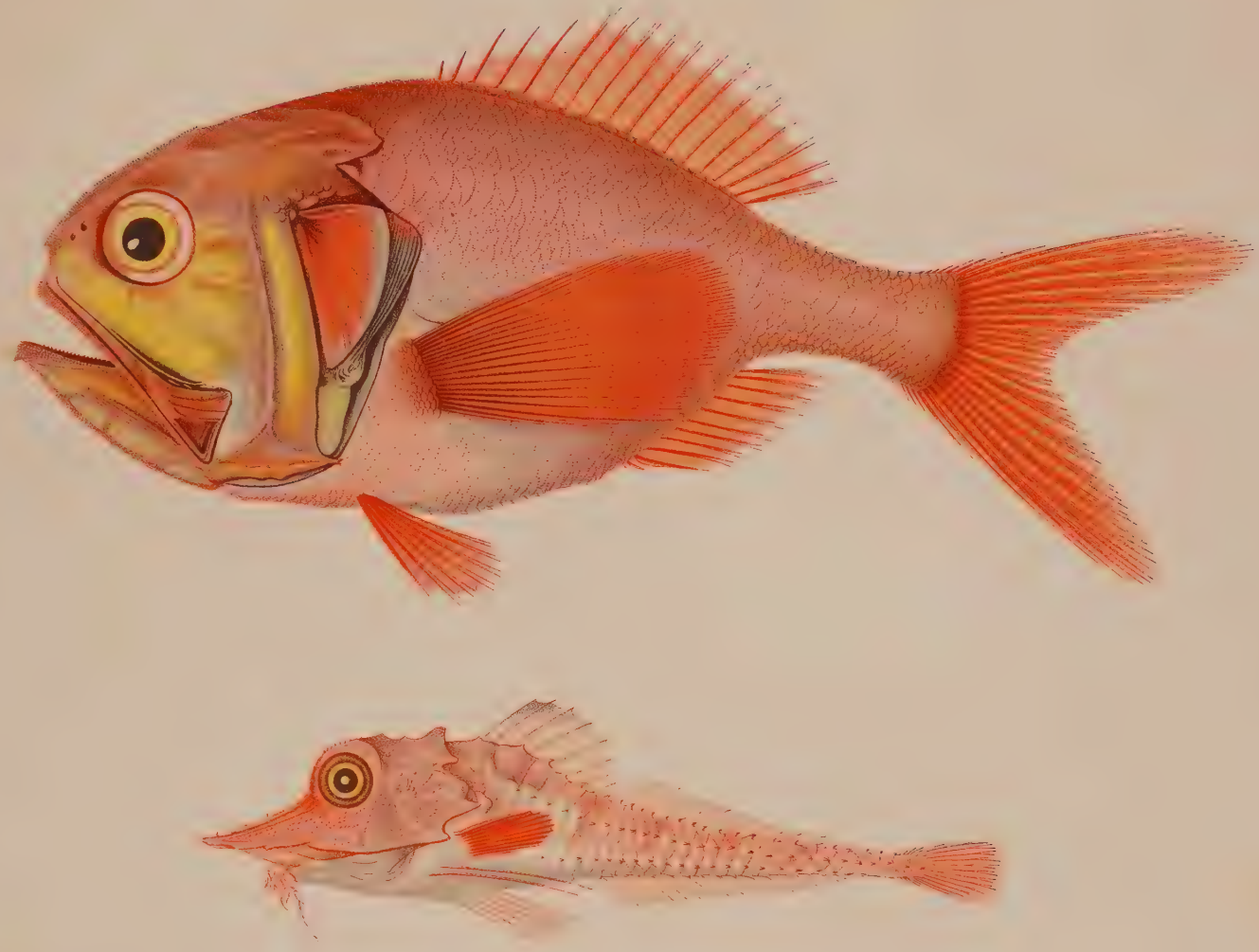
PLATE LXXXV.

Chart of the Route.

PLATE A.

Fig. 1. HOPLOSTETHUS PACIFICUS Garm. Page 56.

Fig. 2. PERISTEDIUM CRUSTOSUM Garm. Page 112.

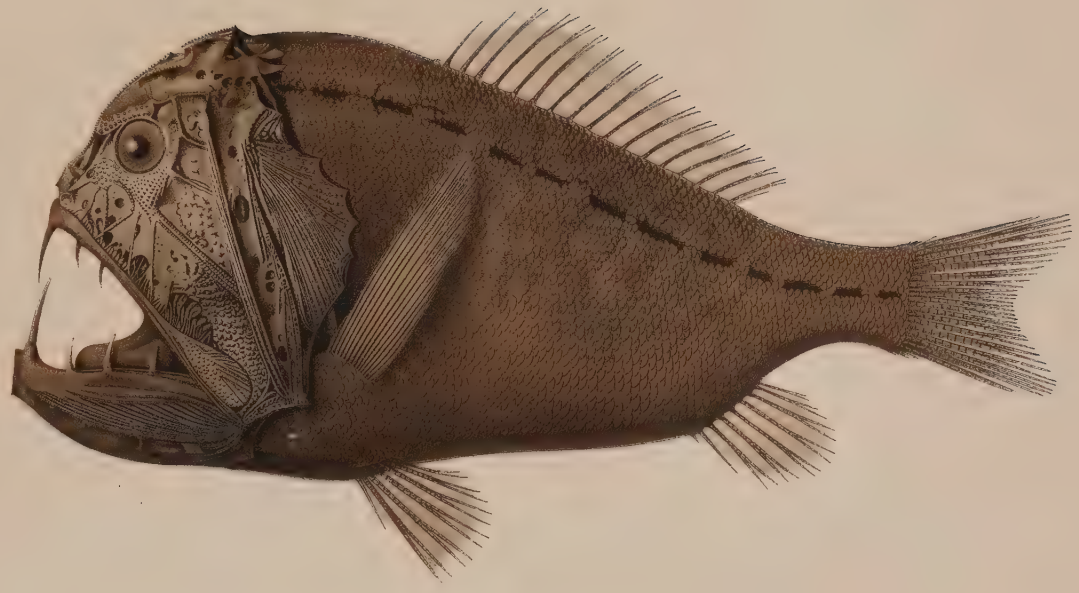


A.M.Westergren, del.

B.Meisel, lith.

PLATE B.

CAULOLEPIS SUBULIDENS Garm. Page 60.



A.M.Westergren, del.

B.Meisel, lith.

PLATE C.

CHAUNAX COLORATUS Garm. Page 83.

A.M. Westergren, del.

B. Meisel, lith.

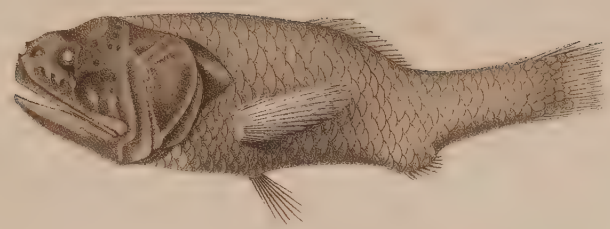
PLATE D.

Fig. 1. Melamphaës maxillaris Garm. Page 66.

Fig. 2. Melamphaës nigrofulvus Garm. Page 64.

Fig. 3. Paraliparis fimbriatus Garm. Page 116.

1.



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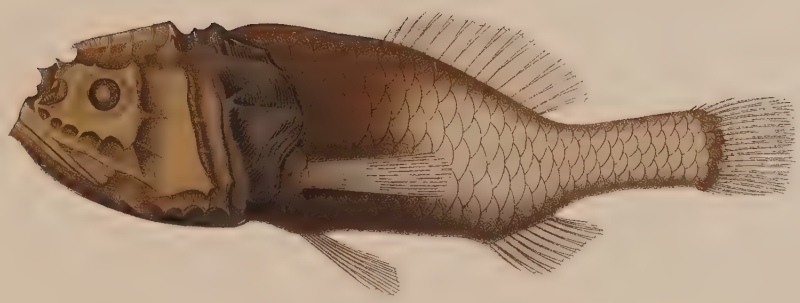

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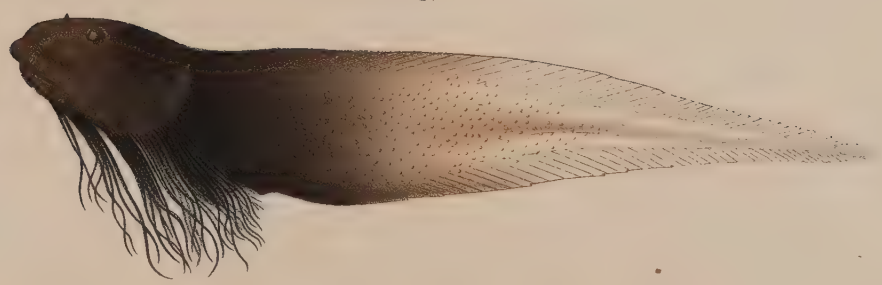


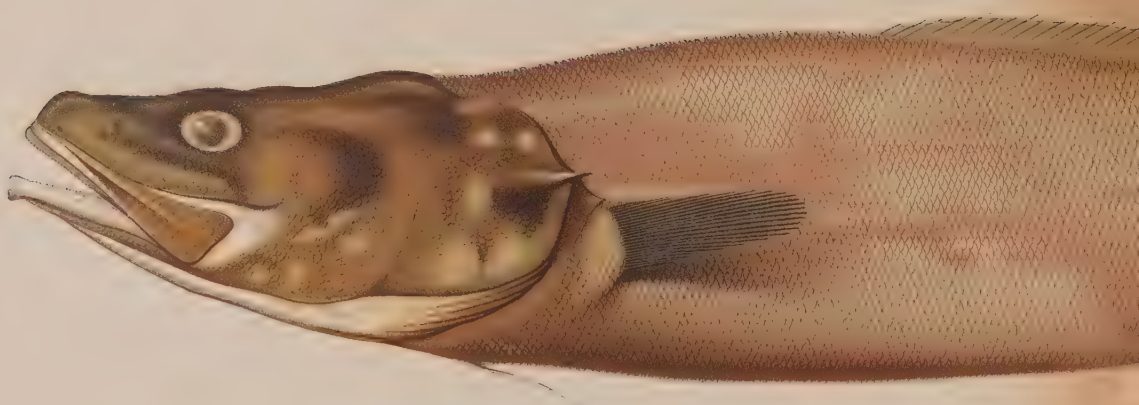
A.M. Westergren. del. B. Meisel. lith.

PLATE E.

Fig. 1. Maynea bulbiceps Garm. Page 140.

Fig. 2. Catætyx simus Garm. Page 168.

2.



1.

A.M.Westergren, del.

B. Meisel lith.

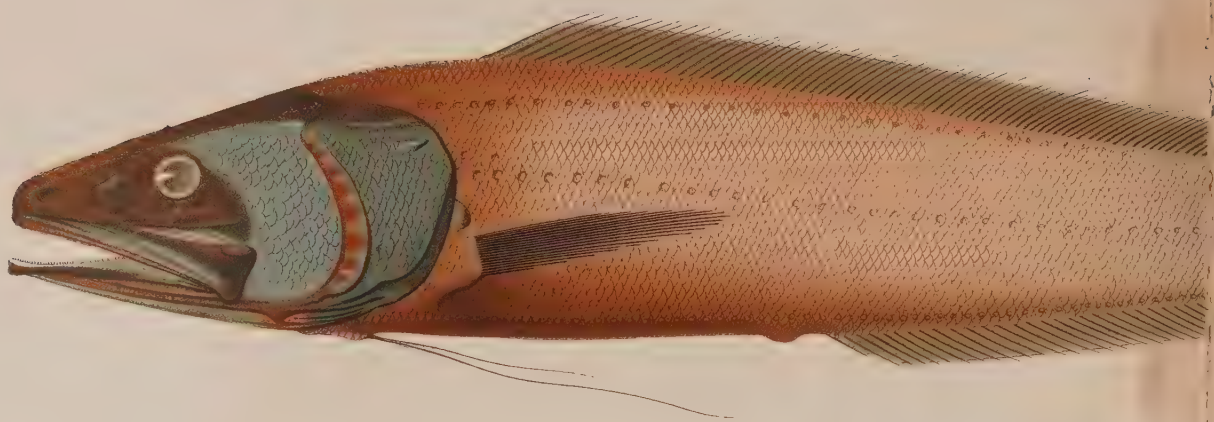
PLATE F.

Fig. 1. Dicrolene filamentosa Garm. Page 149.

Fig. 2. Porogadus longiceps Garm. Page 153.

Fig. 3. Acanthonus spinifer Garm. Page 170.

Fig. 4. Sciadonus pedicellaris Garm. Page 172.



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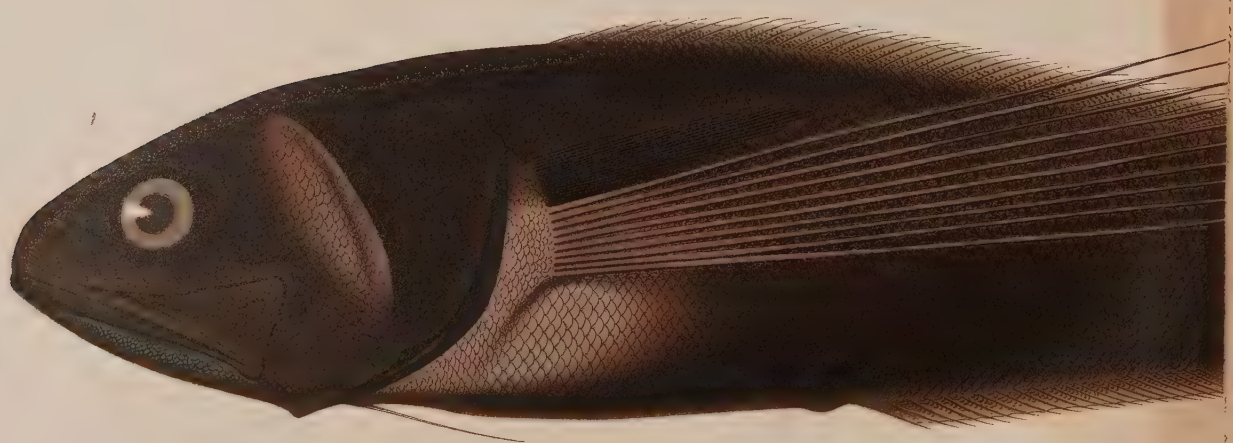
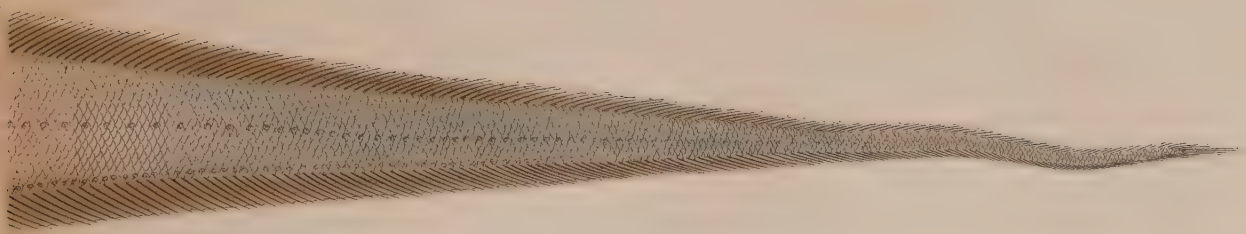


A.M.Westergren, del.

2.



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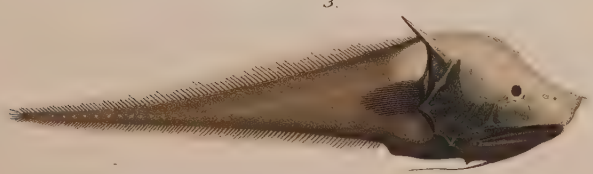
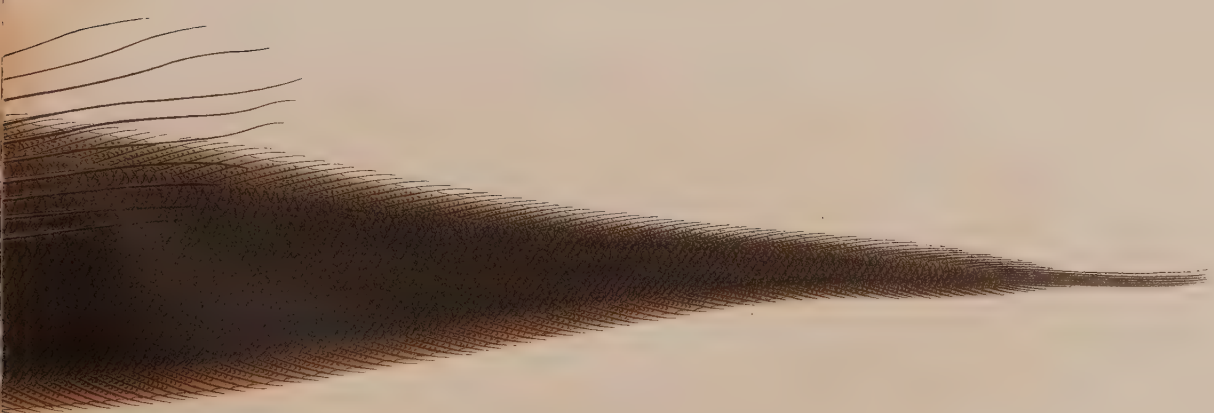


3a.

1.



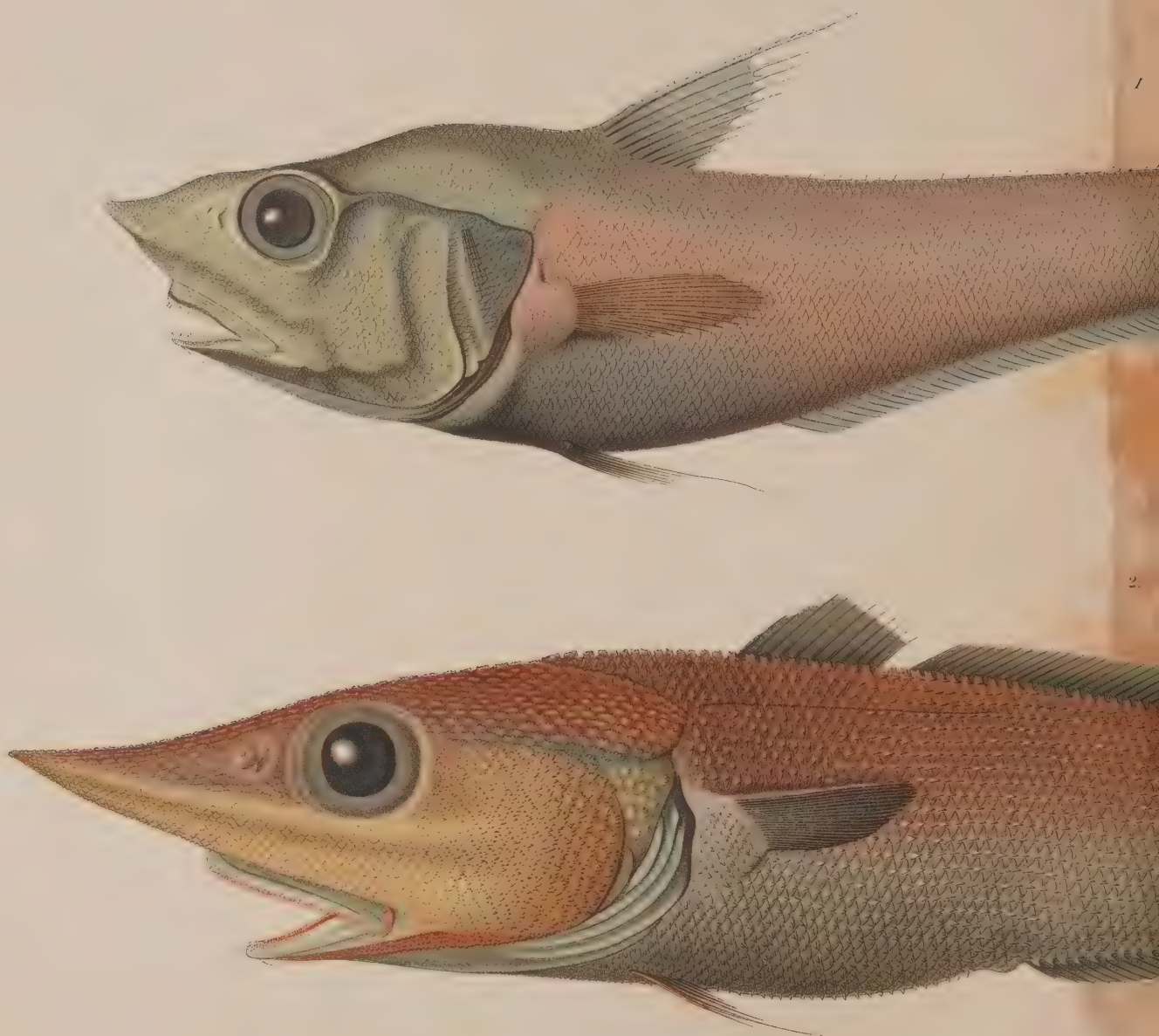
B. Meisel. lith.

PLATE G.

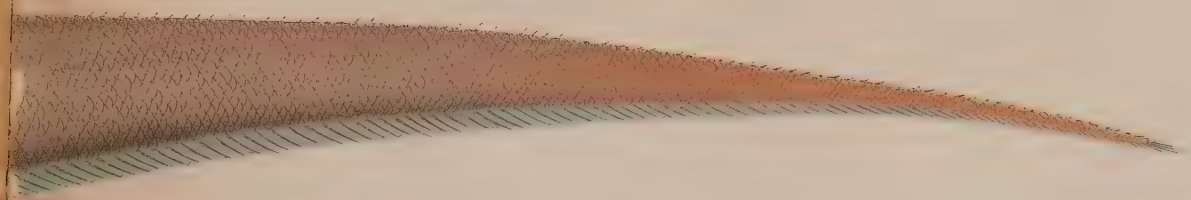
Fig. 1. MACRURUS ANGULICEPS Garm. Page 212.

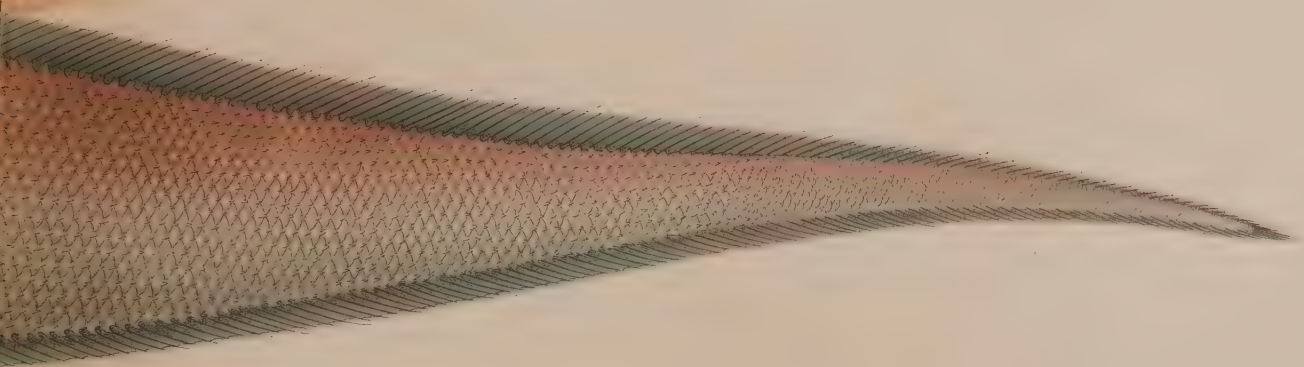
Fig. 2. TRACHYRHYNCHUS HELOLEPIS Gilb. Page 218.

ALBATROSS EX. 1891.



A.M. Westergren, del.





B Meisel lith

PLATE H.

Fig. 1. Macrurus gracillicauda Garm. Page 206.

Figs. 2, 2ª. Ipnops Agassizii Garm. Page 259.

A.M. Westergren, del B. Meisel, lith.

PLATE J.

Figs. 1–1[b]. ARGYROPELECUS LYCHNUS Garm. Page 234.

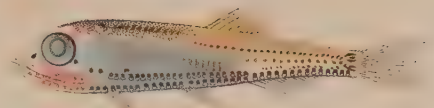
Fig. 2. MAUROLICUS LUCETIUS Garm. Page 242.

Fig. 3. CYCLOTHONE SIGNATA Garm. Page 246.

Fig. 4. CYCLOTHONE ACCLINIDENS Garm. Page 247.

Fig. 5. MYCTOPHUM TENUICULUM Garm. Page 262.

2.



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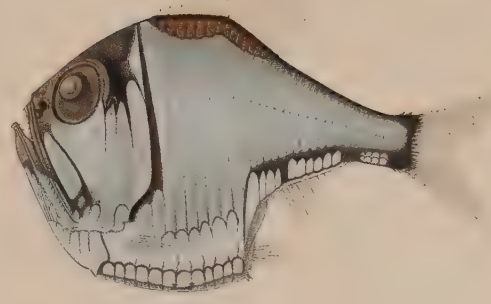
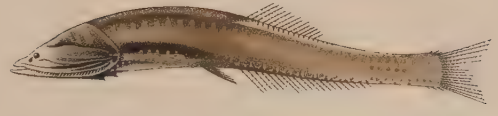
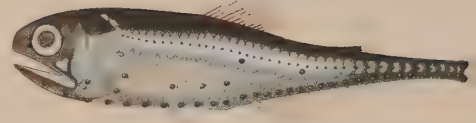


1b.

4.



5.



A.M.Westergren, del.

B.Meisel, lith.

PLATE K.

Fig. 1. Bathypteroïs pectoralis Garm. Page 257.

Figs. 2, 2ª. Chauliodus barbatus Garm. Page 271.

Fig. 3. Chauliodus Sloani Bl. Schn. Page 274.

A.M.Westergren, del

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PLATE L′.

Fig. 1. Entomacrodus cruentatus Garm. Page 123.

Fig. 2. Teuthys elegans Garm. Page 70.

Fig. 3. Synodus simulans Garm. Page 251.

Figs. 4–4^{b}. Notacanthus spinosus Garm. Page 301.

PLATE M.

Fig. 1. Bathytroctes inspector Garm. Page 288.

Figs. 2, 2ª. Venefica tentaculata Garm. Page 319.

A.M. Westergren, del

PLATE N.

XENOMYSTAX RICTUS Garm. Page 315.

A.M.Westergren, del.

B.Meisel lith.